# COMMERCIAL FISHERIES REVIEW

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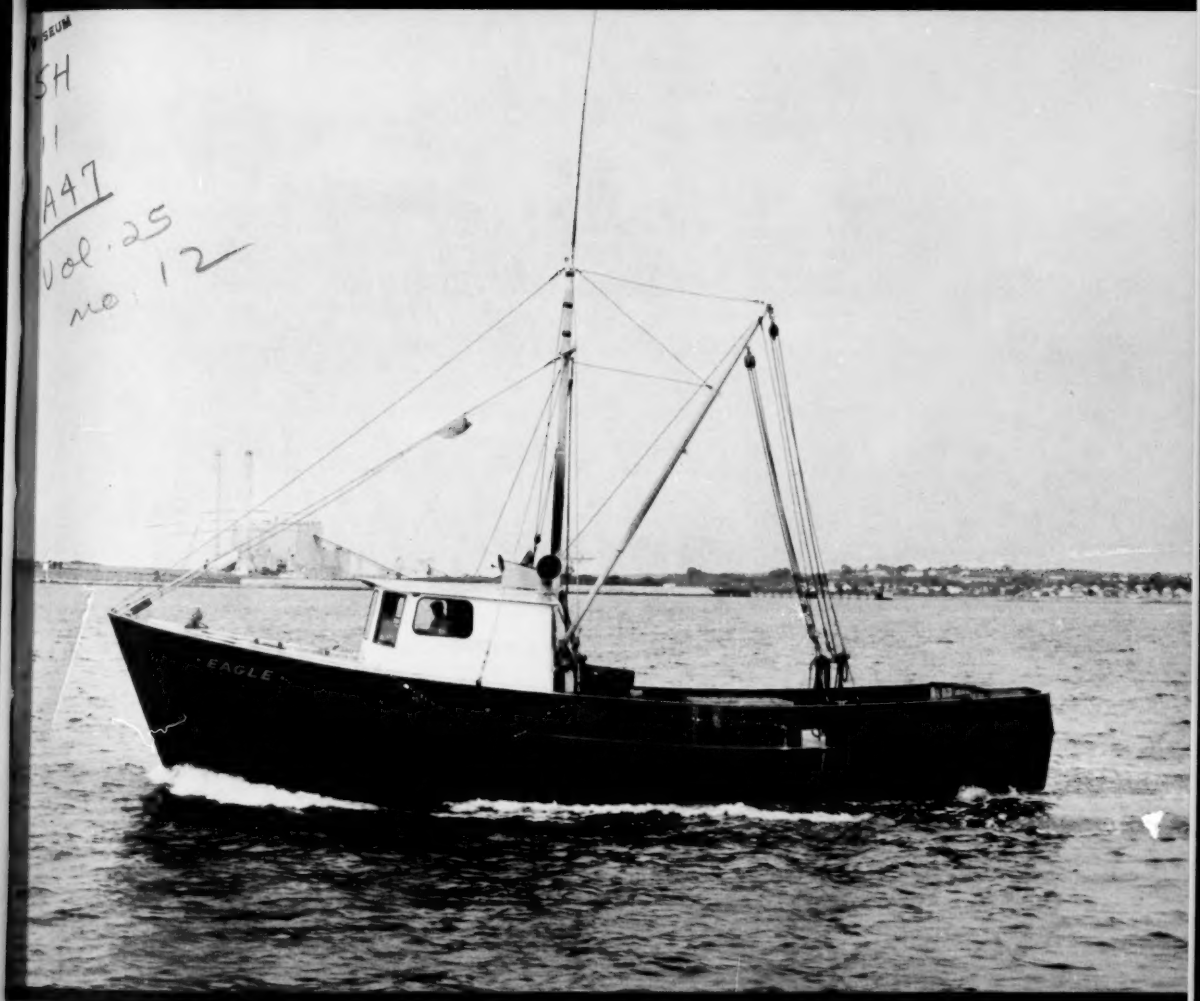


VOL. 25, NO. 12 DECEMBER 1963

UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR
STEWART L. UDALL, SECRETARY

FISH AND WILDLIFE SERVICE
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RALPH C. BAKER, CHIEF

# COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
G. A. Albano, H. M. Bearse, and H. Beasley, Assistant Editors

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 1, 1963.

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COMMERCIAL FISHERIES REVIEW

December 1963 Washington, D. C. Vol. 25, No. 12

# AN ELECTROMECHANICAL FISHING AND COUNTING FENCE USED IN IRELAND

Julius Rockwell, Jr.*

ABSTRACT

On Ireland's River Shannon salmon are fished by a large permanent weir which contains fish traps. The weir extends across the river and a carefully regulated escapement is counted through at frequent intervals during the entire run. Electric counting devices are used to count the escapement and electric shocking devices are used to kill the fish taken.

## INTRODUCTION

Salmon are permitted to escape to upriver fisheries and spawning, and a regulated percentage is then killed electrically after being caught in stationary traps in the River Shannon at Thomond near the southwest coast of Ireland. This installation of the Electricity Supply Board of Ireland is of particular interest because the most effective regulation of a salmon stock is possible when the escapement to an individual river can be carefully controlled. The principle of controlled fishing of the river mouth is similar to one employed by the Soviets and described previously in Commercial Fisheries Review, July 1957 p. 32.

The fence or weir of this Shannon fishery extends completely across the river and contains traps in which are electric fishing or electric fish-counting equipment. The river at Thomond is moderately large being in the order of 180-300 cubic meters per second. The annual run to the Shannon has been estimated to be 20,000 salmon a year of which approximately 13,000 reach the weir. Of these latter the Electricity Supply Board, which owns the fishery, takes 28 percent for commercial purposes. In Ireland the fishing rights are private property and go with the land on the river shore. Excerpts from a series of personal letters from S. Drummond Sedgwick, former Fisheries Manager of the Electricity Supply Board, and J. A. Williams, his successor, describe the installation in greater detail. The individual photographs were supplied by the writers indicated, from the files of the Electricity Supply Board.

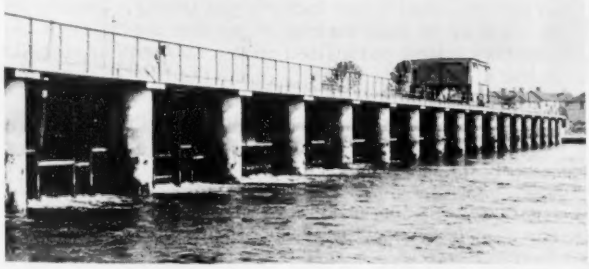

Fig. 1 - The Thomond counting fence and salmon fishing weir on the River Shannon in Ireland. The weir gantry raises the counters and trap floors. Salmon are counted through traps and 28 percent are removed as the catch.

"One of our fisheries employs a counting fence of which I enclose photographs (fig. 1). This is a very heavy arrangement spanning a wide river and is used for commercial fishing

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U. S. DEPARTMENT OF THE INTERIOR
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as well as for counting. The entire run of Atlantic salmon entering the river is counted continuously and a proportion of them (28 percent at present) are taken commercially by controlled trapping. The traps are fitted with electrodes which kill the fish instantaneously when the traps are fished (figs. 5 and 6). This counting fence is in fresh water but there is a tidal change of up to 15 feet. This leads to considerable complication in underwater (counting) gear using a standard tube-type detector tunnel. Arrangements had to be made for the tunnel to rise and fall according to tide changes if the fish were to find it easily on the levels in which they were moving. In fact, as you know, the fish tend to move against the current, consequently it was found that a wide change in settings of the detector tunnel was not required. The flow of the river is very strong at this point . . . and the (hydraulic) action of the tube itself under maximum flows presented some obstacle to fish. (Sedgwick, May 20, 1958.)

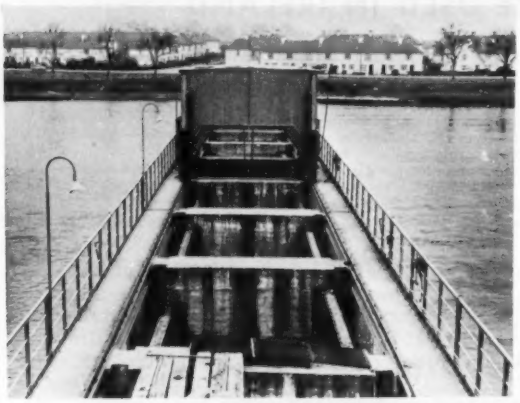


Fig. 2 - Top of weir. This gantry runs on rails across the top of weir. Four traps are visible in the foreground. Note light safety screens in position on the gantry. These operate interlock switches so that the killing apparatus cannot be switched on until screens are in position.

"The figure of 28 percent was arrived at in rather a strange way. There was a weir fishery for salmon near the site of the present counting and catching device. This old fishery operated on the standard British method of cruive fishing. A number of traps were built into a stone wall extending across the river; at the point of maximum flow a statutory gap equal to one-third of the width of the river had to be left as a free passage for salmon. The number of fish taken in the traps depended on a proportion of the run of fish passing in the weir finding their way into the traps rather than through the gap. When the new fishing weir was built it was decided, arbitrarily, to count all the fish passing through the weir and to take one-third of the total commercially. The method of arriving at the correct number of fish to catch was worked out retrospectively. For example, 200 salmon were visually counted as they swam through the port opened in the weir over a white painted plate. The gap was then closed and the entrances to traps in other parts of the weir were opened. These fished until approximately 100 salmon had been caught, the trap entrances were then closed and counting began. At the weekends the weir is not allowed to fish commercially for forty-eight hours. During this period, the fish are visually counted. The number of fish that have passed during the weekend are allowed to count towards the percentage catch permitted in the subsequent week. If the requisite percentage cannot be caught in the subsequent week it is not permitted to carry-over the remainder into a following week. The Electricity Supply Board of Ireland who constructed the fishing weir at Thomond also had other rights for salmon fishing in the estuary of the river. These rights permitted the use of pound nets very similar to the type used on the Miramichie in New Brunswick. When Thomond Weir was built, the Electricity Supply Board waived its right to operate the fixed nets. Shortly after the last war the Board decided to start fishing again with the fixed nets. It was then decided to reduce the percentage from one-third to 28 percent in compensation for the reduced number of fish which might reach Thomond. (Sedgwick, November 22, 1960.)

"Up until eighteen months ago, only one electronic counter was in use. This was sited to pass clean through the fishing weir grids so that fish could swim freely upstream through the counter. The fish used the counter satisfactorily although it represented only 1 yard of width in a distance of approximately 150 yards. At times when large numbers of fish were running, the electronic counter was assisted by visual counting. The weir is at the head of tide and is in fact subject to a very considerable tidal rise and fall although the water is fresh. There is, therefore, a reverse flow through the weir at high tide. It has been found from experience that salmon do not make any attempt to pass through the weir or even to run up to it from approximately half flood to half ebb, consequently the periods in which counting was re-

quired are materially reduced. The main purpose of the electronic counter was to avoid the necessity for employing staff on visual counting at weekends. . . . It should be clearly understood that the fish to be counted are not trapped in any way, but are counted as they swim freely through gaps or through the electronic counter in the weir. While counting is in progress the traps are closed and fish cannot enter them. It is only when a worthwhile number of salmon have passed through the weir that the counter arrangements are closed off and the fish enter the traps. (Sedgwick, November 22, 1960.)

"The weir was completed in 1940. Originally, prior to hydro-electric development, the Shannon had a very much larger run of salmon, probably in the region of 50,000 to 100,000 fish a year. The effect of the hydro-electric scheme was to divert the river from its old course; no fish pass was provided on the diversion, salmon entered the diversion in thousands in the initial years and found nowhere to spawn. Eventually, practically speaking, the entire middle and upper reaches of the river became denuded of a stock of salmon. My own work in Ireland was primarily to seek to restore the run of salmon, involved the design and construction of a new fish lift on the diversion side of the river and the construction of a salmon smolt rearing station and hatchery. The hatchery has a capacity of approximately 6 million eggs and the rearing station of approximately 500,000 parr. The hatchery and rearing station are being used to repopulate the middle and upper reaches of the river. (Sedgwick, November 22, 1960.)

"The new fish pass on the Shannon is working well and salmon are now reaching upstream, spawning in middle and headwater tributaries where none have been seen for 30 years." (Sedgwick, November 22, 1960.)

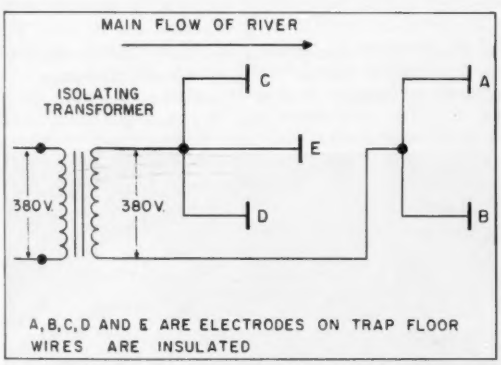



Fig. 3 - Schematic wiring diagram for shocking electrodes. An isolation transformer confines the electric field to the vicinity of the electrodes. The voltage gradients are sufficient to stun the fish between pairs C and D and A and B, and to kill them between E and A and B.

Fig. 4 - Reaction of salmon after switching on power. The surface gradient of 80 volts per meter (with a load of 4 amperes) is sufficient to kill in 15 seconds.

J. A. Williams, in June 1961, supplied further information:

"As regards the weir, this replaced an old weir on the River Shannon which was probably there since pre-historic times. The new weir is, generally speaking, a modern version of an old weir which was in operation until 1935. The type of salmon trap used is basically the same. In principle, the trap consists of two sets of screens spanning between adjacent piers, one at the upstream end of the piers and the other at the downstream end. These screens have 2" bar spacing except the special 'V' shaped screen in the centre of the downstream set which has one central opening 5½" wide. Salmon enter the traps through this 5½" opening and lie with their noses against the upstream screens. They are removed from the traps when they are required for marketing. As you know, a salmon weir in Ireland usually extends right across the river from bank to bank except for the free gap which, according to Law, must occupy at least 1/10th of the width of the river and must be placed in the most favourable location for the passage of salmon. The weir then consists of a number of trap gaps covering the known

passage where salmon normally run, the free gap (this is sometimes known as the King's gap or the Queen's gap) and a number of stop gaps which block off the remaining section of the river. In order to use the weir as a scientific tool of fisheries management, permission was obtained by the Board to block the free gap and instead all fish are counted as they arrive at the weir. This counting is sometimes carried out by visual observation of the fish passing a white board and sometimes by an electronic counter. The fish are not stopped or taken out or handled in any way. The recording is to all intents and purposes automatic. 72 percent of the 'run' are released upstream for propagation purposes and for angling. The remaining 28 percent are marketed. Special trays with mechanical lifting equipment are provided in the traps for the purpose of lifting fish out. All the screens are interchangeable so that the position of the traps can be altered at any time if considered necessary. In recent years new smaller screens $1\frac{1}{2}$" wide are used in the summer in the traps, except in the heck and inscales, i.e. the 'V' shaped section, as it was found that some of the smaller grilse in the Shannon were able to pass through the 2" gaps. As a further effort in improving the efficiency of the weir, in June 1956 experiments were carried out to determine the most suitable method of killing fish using the lowest voltage in the shortest time possible. The electrical equipment was installed in the crane-house for raising and lowering the trays and electrodes were placed on the trays in the traps. Final tests showed that 380 volts was most effective and operated in 15 seconds, and this arrangement was decided upon for future use. The fish, therefore, in the weir are killed electrically and as they are in first class condition, they commond top prices in the salmon markets. (Williams, July 14, 1961.)

"To eliminate the possibility of anyone entering the gantry or trap while killing was in progress, electrical protection was devised. The system of electrodes has given continuous satisfaction." (Williams, July 14, 1961.)

Patrick J. Sharkey of Dublin, who installed the electrical equipment, writes that isolation transformers are used to insure that trash screens and other metal fittings do not become part of the circuit (fig. 3). Photographs of the Electricity Supply Board illustrate further details (figs. 2, 4, 7, and 8).

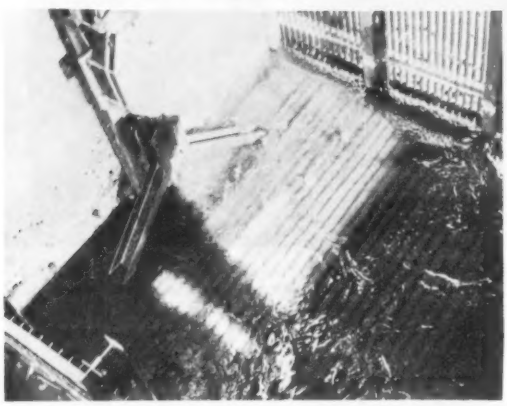


Fig. 5 - Salmon just after killing on trap floor. The trap is in the down position.

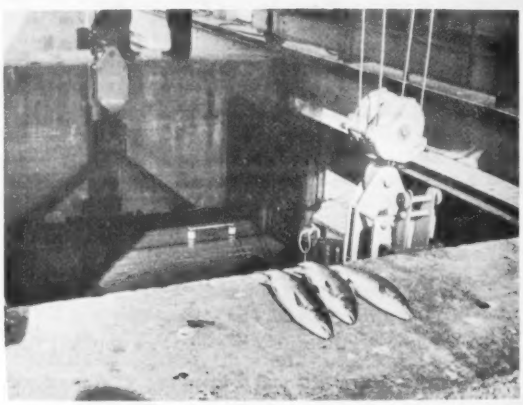


Fig. 6 - Trap floor. The electrodes for killing fish are energized to 380 volts by an alternating current.

Electric fish counters have been under operational development for a number of years in Scotland (Lethlean 1953), Ireland (Jackson 1953), Japan (Suetake 1955), and in the United States (Rockwell and Chur 1959; vanHaagen 1959; vanHaagen and Rockwell 1960).

Describing those counters J. A. Williams writes.

"As regards the electronic fish counters, these have been pioneered in Ireland by the Board and a small electronic firm. Information is required on the movements of fish in the

Fig. 7 - Raised trap. The trap floor is raised after kill. Note electrodes. The safety screen is in a raised position.

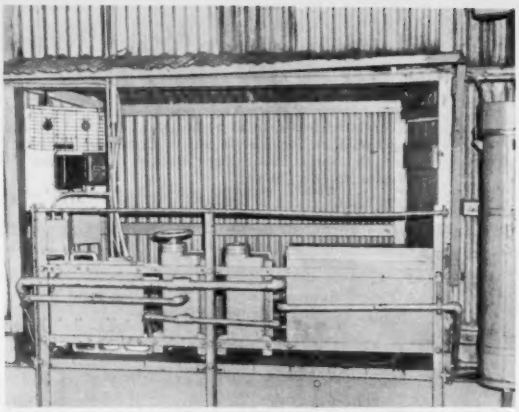


Fig. 8 - Control panel of shocking apparatus. The warning lights and the controls for the electrical killing apparatus (top left-hand corner) are located in the control cabin of the gantry.

fish passes of the Board's hydro dams and all the fish passes have been equipped with electronic counters. You are no doubt familiar with the counter designed by Mr. Lethlean in Scotland. The Board's counters are rather similar to some extent. The counter, therefore, was specially developed for use in the Borland-type fish pass. The under-water fish detecting part of the installation takes the form of a channel secured to the upstream side of the escape sluice of the pass. This channel is 6 ft. long, 3 ft. wide and 18 inches deep. Three brass electrodes are fitted transversely at 1 ft. 8 ins. centres in the end of the channel remote from the gate. These electrodes sensitise about 16 cubic feet of water in the channel. Fish passing through the sensitive area of water cause electrical currents to be fed into the counting instrument via the interconnecting cable. From the sequence in which these currents arrive and from their magnitude, the instrument can (a) sense the direction in which fish are moving, for example, upstream or downstream, and (b) determine the size of the fish. These currents from the under-water gear are henceforth referred to as signals. Spurious signals due to wave action in the reservoir or arising from the automatic level control equipment on the gate will not interfere with the proper functioning of the instrument or cause it to make up false counts. The counter is uni-directional and will not operate on descending fish or on incomplete passages by either ascending or descending fish. Kelts tailing downstream into the sensitive area of water and sawing backwards and forwards across the electrodes will not cause a succession of false counts as the instrument is designed to lock-off under these conditions. Frequently as many as 100 fish may be raised to reservoir level in a single operation of the lift. As soon as the water level in the stilling pool permits, the salmon escape across the sill of the sluice gate, through the counter channel and into the open waters of the reservoir. When such large numbers are lifted, salmon go through the channel in rapid succession and the counter must be able to deal with them at the rate of 5 per second. The counter instrument itself may be divided into 5 units, the bridge energizing oscillator, the amplifier, the bridge circuits, logic circuits, and the power supply. The counters, which were designed originally experimentally, are now working very satisfactorily and give the Board a fairly accurate indication of the runs of fish at the various passes. This information is vital in fisheries management."

The method of escapement regulation illustrated is similar in principle to one used in Russia (Chernigan 1956, and U. S. Bureau of Commercial Fisheries 1957) for both provide methods of fishing the stocks of separate rivers separately, and provide incentive for more effective river management.

LITERATURE CITED

CHERNIGAN, N. F.
1956. A New Method of Catching Fish. Rybnoe Khoziaistvo, vol. 32, no. 2 (February), pp. 22-29 (In Russian). Translated into English by Emily R. Moe, U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Biological Laboratory (Seattle), Translation Series No. 31, 11 pp.

FISH AND WILDLIFE SERVICE, U. S.
1957. A New Technique for Electrical Fishing. Commercial Fisheries Review, vol. 19, no. 7 (July), pp. 32-34.

JACKSON, P. A.
1953. A Simple Type of Fish Counter. Salmon and Trout Mag., no. 138, pp. 170-171.

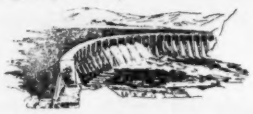
LETHLEAN, N. G.
1953. An Investigation Into the Design and Performance of Electric Fish-Screens and An Electric Fish Counter. Transactions of the Royal Society of Edinburgh, vol. 62, part II (no. 13), pp. 479-526, 25 fig. 2 pl.

ROCKWELL, JULIUS, Jr., and SUNG PAL CHUR
1959. An Underwater Observation Chamber. Progressive Fish-Culturist, vol. 21, no. 3, pp. 131-134.

SUETAKE, TOSHIO
1955. On the Recording Equipment Taking a Count of Salmon Numbers by the Utilization of Photoelectric Cell (Preliminary Note). (In Japanese). Scientific Reports of the Hokkaido Fish Hatchery, vol. 10 (1/2), pp. 73-81. (U. S. Fish and Wildlife Service Translation Series No. 28).

vanHAAGEN, R. H.
1959. Bi-directional Electric Counting System. United States Patent No. 2,893,633, 6 pp.

_____, and JULIUS ROCKWELL, Jr.
1960. Directional Fish Counter for Field Use. Review of Scientific Instruments, vol. 31, no. 3, pp. 342-343.



CONSERVATION THOUGHT

When birdlife is not present on the land and when fish are not present in our waters it is an indication that Man is not making proper use of his natural resources. We can have more wildlife as well as more farms, factories, and cities, if we include wildlife in our planning.

Federal and State Agencies have authority in conservation matters but responsibility rests with the people. Wise use of natural resources is possible only when people understand and apply the rules and practices that are needed. That is why conservation is taught in our schools.

Conservation begins with land and water and public support.

Helping adjust fisheries and wildlife resources to food and recreational needs of the Nation is the task of the Fish and Wildlife Service

FISH AND WILDLIFE SERVICE
U. S. DEPARTMENT OF THE INTERIOR

# SCOPE RATIO-DEPTH RELATIONSHIPS FOR BEAM TRAWL, SHRIMP TRAWL, AND OTTER TRAWL

By Walter T. Pereyra*

ABSTRACT

The scope ratio-depth relationships for three types of trawls used during demersal fish and shellfish resource surveys by Bureau of Commercial Fisheries vessels in the eastern North Pacific are summarized. The three types of trawls used were a 20-foot beam trawl, 43-foot Gulf of Mexico shrimp trawl and a 400-mesh fish trawl.

Force factors that influence the choice of optimum scope ratios include towing speed, tension (drag) at the end of the towing cable, sea condition, weight of the gear, and weight of the cable. An increase in magnitude of speed, tension, or sea conditions make necessary a larger scope ratio, whereas an increase in the weight of gear or cable tends to allow a reduction in the ratio.

The scope ratio-depth relationships are different for each of the three types of gear studied. At depths of less than 150 fathoms the shrimp trawl required the highest ratio and the fish trawl the lowest.

## INTRODUCTION

Despite the vast amount of trawling that is done around the world, published information on scope ratios[1] employed is scanty. The most detailed account to date is given by Kullenberg (1951), who discusses the computations used to describe the shape relationships of the trawling cable used aboard the Swedish deep-sea research vessel, Albatross. This paper is very theoretical and, thus, would be of limited practical value. Gourock's (1961) practical book on deep-sea trawling recommends warp in the amount of three times the depth of water, plus one extra length[2] for luck. Thus, if fishing at a depth of 50 fathoms, 175 fathoms of warp would be used. Based on actual measurements in 9.3 fathoms of water, de Boer (1957) recommends a scope ratio of about 5.5:1.

Other accounts given by Bullis (1951), Miyamoto (1957), Saito (1957), and Wathne (1959) point out the need for greater scope ratios in shallow water, and Miyamoto (1957) gives the equation $F = (3 + \frac{25}{D})\ D$ for determining the length of warp (F) needed at any depth (D).

Since 1949, the Seattle Exploratory Fishing and Gear Research Base of the U. S. Bureau of Commercial Fisheries has conducted more than 60 cruises along the Pacific coast from northern Mexico to the Arctic Circle. Of these cruises, 28 have been demersal fish and shellfish trawl surveys. Survey results have been published in various journals to provide fishermen with data on the distribution and relative abundance of latent marine resources in this region, but the range of scope ratios used by depth has not been reported. Therefore, this paper is presented to provide a summary of the successful scope ratio[3] used during demersal fish and shellfish surveys conducted from the Seattle Base. This information should be of particular value as vessels are equipped with greater lengths of cable, thereby permitting fishing activities at depths greater than those now being exploited.

## VESSELS AND GEAR

VESSELS: Vessels used to conduct the surveys and collect the data for this report were: the M/V John N. Cobb, the Bureau's 93-foot exploratory fishing vessel (Ellson, 1950); the M/V Commando, a 65-foot purse seine-type research vessel chartered by the Bureau from the College of Fisheries, University of Washington; and the chartered 75-foot schooner-type

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1/Scope ratio is the ratio of trawling cable out to water depth.

2/In this situation a length is equal to 25 fathoms.

3/A successful scope ratio pertains to the ratio used for a drag that was considered to have fished properly (i. e. the gear was on bottom and performed in a normal manner).

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vessel, Tordenskjold (Greenwood, 1958). All of these vessels employed ½-inch diameter towing cable.

GEAR: Whereas various types of gear have been used throughout the years in carrying out exploratory operations, scope ratio data pertaining to only three (20-foot beam trawl, 43-foot Gulf of Mexico shrimp trawl, and 400-mesh otter trawl) were summarized for this report.

The 20-foot beam trawl was used in connection with the original shellfish explorations in southeastern Alaskan waters. It is described in detail by Ellson and Livingstone (1952). A single towing cable was used to fish this gear.

The shrimp trawl data were taken from drags made with a 43-foot Gulf of Mexico-type flat shrimp trawl (Schaefers and Johnson, 1957). The doors used with this trawl measured 2½ by 5 feet and weighed approximately 160 pounds each. For drags deeper than 500 fathoms approximately 150 pounds of steel plate was added to the bottom of the doors. Like the beam trawl, the shrimp trawl was towed with a single cable. Doubling the available length of fishable cable by connecting the towing cables end to end permitted operation of the trawl at depths greater than 500 fathoms.

The otter trawl has been used primarily in bottom fish surveys along the Pacific coast. Both the 400-mesh Western-type (Alverson, 1951) and the 400-mesh Eastern-type (Greenwood, 1958) have been used. The doors used with these trawls were larger and heavier than the shrimp trawl doors, measuring 4 by 8 feet and weighing approximately 850 pounds each. The 400-mesh otter trawl was towed with two cables, one to each door, instead of a single cable as with the shrimp and beam trawls.

## DATA

Only data for successful drags are included in this report. These data were taken from John N. Cobb cruises 9, 13, 15, 18, 24-26, 29, 37-40, 44, 48, 50, and 52-54; Commando cruises 1-5; and Tordenskjold cruise 32. Scope ratios were calculated from the amount of cable out and the water depth at the time of setting.

Inspection of the data revealed that the scope ratios did not differ greatly among the vessels when similar gear and depth were fished. Therefore, the data from the three vessels were combined. Since the manner of fishing the 400-mesh Eastern and Western-type trawls was similar, the data for these gear were combined.

## RESULTS

A summarization of scope ratio data for 133 beam trawl drags, 288 shrimp trawl drags and 429 otter trawl drags is presented in table. Graphical representations of the scope ratio-depth relationships of these data are shown in figure 1.

The shrimp trawl was used over the greatest range of depth, 15 to 1,000 fathoms. No drags were made at depths between 275 and 599 fathoms. Average scope ratios ranged from 5.3:1 to 1.7:1. The beam trawl was fished at depths from 21 to 151 fathoms with scope ratios ranging from 5.0:1 to 2.2:1.[4/] Depths fished with the otter trawl ranged between 10 and 550 fathoms with scope ratios ranging between 4.7:1 and 1.5:1. Since no accurate measurements were made of towing speeds, it has been assumed that they were generally equivalent.

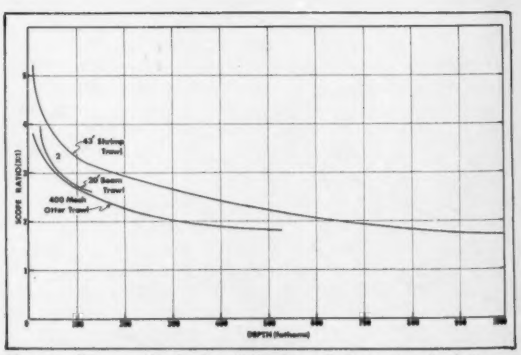



Fig. 1 - Scope ratio-depth relationships for beam trawl, shrimp trawl, and otter trawl. Data used to plot thse curves were taken from the table.

4/The restriction of this gear to inshore shrimp explorations accounts for the lack of drags at depths greater than 151 fathoms.

Summary of Successful Scope Ratio Observations for 133 Beam Trawl, 288 Shrimp Trawl, and 429 Otter Trawl Drags

| Beam Trawl | | | | Shrimp Trawl | | | Otter Trawl | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth Interval (Fathoms) | No. Drags | Range of Scope Ratios | Average Scope Ratio | No. Drags | Range of Scope Ratios | Average Scope Ratio | Depth Interval (Fathoms) | No. Drags | Range of Scope Ratios | Average Scope Ratio |
| 0 - 19 | - | - | - | 2 | 5.0 - 5.3 | 5.2 | 0 - 19 | 11 | 2.9 - 4.7 | 3.8 |
| 20 - 29 | 3 | 3.6 - 4.6 | 4.1 | 6 | 2.9 - 5.0 | 3.8 | 20 - 29 | 16 | 2.9 - 3.8 | 3.3 |
| 30 - 39 | 17 | 2.6 - 4.0 | 3.1 | 8 | 3.0 - 5.4 | 4.2 | 30 - 39 | 13 | 2.8 - 4.3 | 3.2 |
| 40 - 49 | 23 | 2.6 - 5.0 | 3.4 | 5 | 3.4 - 5.7 | 4.3 | 40 - 49 | 12 | 2.8 - 3.7 | 3.2 |
| 50 - 59 | 25 | 2.4 - 3.7 | 3.0 | 14 | 3.1 - 4.3 | 3.8 | 50 - 59 | 19 | 2.5 - 3.5 | 3.0 |
| 60 - 69 | 17 | 2.5 - 3.7 | 3.1 | 27 | 3.0 - 4.0 | 3.5 | 60 - 69 | 15 | 2.5 - 3.4 | 3.0 |
| 70 - 79 | 19 | 2.3 - 3.3 | 2.8 | 29 | 3.1 - 4.3 | 3.4 | 70 - 79 | 11 | 2.5 - 3.0 | 2.8 |
| 80 - 89 | 13 | 2.5 - 3.4 | 2.8 | 20 | 2.9 - 3.8 | 3.3 | 80 - 89 | 16 | 2.3 - 3.0 | 2.7 |
| 90 - 99 | 8 | 2.5 - 3.3 | 2.7 | 26 | 2.6 - 4.0 | 3.3 | 90 - 99 | 12 | 2.3 - 3.2 | 2.7 |
| 100 - 109 | 4 | 2.4 - 3.0 | 2.6 | 33 | 3.0 - 4.1 | 3.3 | 100 - 109 | 46 | 2.1 - 3.8 | 2.7 |
| 110 - 119 | | | | 27 | 2.8 - 3.8 | 3.2 | 110 - 119 | 21 | 1.9 - 3.0 | 2.4 |
| 120 - 129 | | | | 12 | 2.8 - 3.5 | 3.1 | 120 - 129 | 34 | 2.1 - 3.4 | 2.7 |
| 130 - 139 | 4 | 2.2 - 2.7 | 2.6 | 10 | 2.9 - 3.5 | 3.1 | 130 - 139 | 17 | 2.1 - 3.0 | 2.7 |
| 140 - 149 | | | | 8 | 2.9 - 3.8 | 3.2 | 140 - 149 | 12 | 2.2 - 2.8 | 2.5 |
| 150 - 169 | | | | 16 | 2.6 - 3.4 | 3.0 | 150 - 169 | 22 | 2.0 - 3.0 | 2.6 |
| 170 - 189 | | | | 4 | 2.8 - 3.2 | 3.1 | 170 - 189 | 15 | 1.9 - 2.9 | 2.4 |
| 190 - 219 | | | | 13 | 2.9 - 3.2 | 3.0 | 190 - 209 | 25 | 2.0 - 3.0 | 2.3 |
| 220 - 249 | | | | 7 | 2.2 - 3.1 | 2.8 | 210 - 229 | 19 | 2.0 - 2.7 | 2.2 |
| 250 - 274 | | | | 1 | - | 2.8 | 230 - 249 | 13 | 1.9 - 2.5 | 2.2 |
| 275 - 599 | | | | - | - | - | 250 - 289 | 22 | 1.9 - 2.6 | 2.3 |
| 600 - 699 | | | | 2 | 2.0 | 2.0 | 290 - 329 | 22 | 1.8 - 2.5 | 2.2 |
| 700 - 799 | | | | 1 | - | 1.9 | 330 - 369 | 8 | 1.9 - 2.3 | 2.0 |
| 800 - 899 | | | | 3 | 1.8 - 2.1 | 1.9 | 370 - 409 | 16 | 1.5 - 2.3 | 2.0 |
| 900 - 999 | | | | 3 | 1.8 - 1.9 | 1.8 | 410 - 449 | 3 | 1.6 - 1.9 | 1.8 |
| 1000 | | | | 1 | - | 1.7 | 450 - 489 | 6 | 1.9 - 2.0 | 2.0 |
| | | | | | | | 490 - 529 | - | - | - |
| | | | | | | | 530 - 569 | 3 | 1.5 - 1.9 | 1.7 |

## DISCUSSION

FACTORS AFFECTING SCOPE RATIOS: Consideration of the force factors affecting the choice of a scope ratio is important in understanding the observed relationships. Factors that influence this choice include towing speed, tension (drag) at the end of the towing cable, sea conditions, weight of the gear, and weight of the cable. Consideration of several of these factors is given by Pode (1950 and 1951). An increase in magnitude of speed, tension, or sea condition makes necessary a larger scope ratio, whereas an increase in the weight of gear or cable tends to allow a reduction. It is the resultant of all the above forces that determines the optimum scope ratio required.

RELATIONSHIPS: As can be seen in figure 1, the scope ratio-depth relationships for the three types of gear differ. At depths where all three gear have been fished (shallower than 150 fathoms), the shrimp trawl required the highest ratios and the otter trawl the lowest. The low terminal tension of the shrimp trawl (as compared to the tension of the otter trawl) indicated that a lower scope ratio could be used successfully; however, higher ratios were needed to keep the gear on bottom due to the light weight of doors and single warp towing.

The otter trawl, with heavier doors and double warp towing, required a smaller scope ratio to fish successfully, even though the terminal tension was greatest for this gear. The added weight of cable (double cable towing) and the heavier doors more than compensated for the greater terminal tension and allowed smaller scope ratios than were needed with the single cable shrimp and beam trawl operations.

The beam trawl, towed with one cable, had the least terminal tension. Therefore, it did not require scope ratios as high as the shrimp trawl.

As the depth of water increased, the scope ratio needed to keep the gear on bottom decreased (figure 1). This decrease was due primarily to the added weight of cable used in deeper water. Also, the high ratio, used in shallow water to compensate for the action of the swell and to keep the doors adequately spread (Wathne, 1959), was not needed in deeper water.

Since the deep-water scope ratios used for the gear discussed in this report were less than 3:1, the equation of Miyamoto (1957) gives scope ratios which are probably in excess of the optimum needed in deeper water.

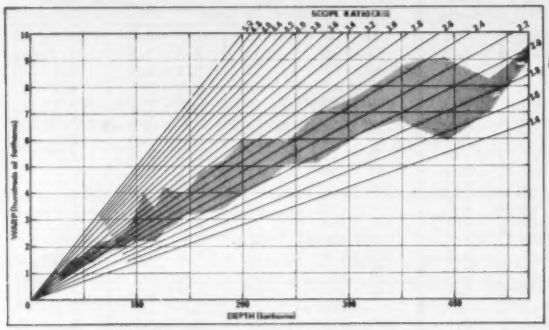


Fig. 2 - Graph for determining the amount of cable (scope) needed at any depth to get a desired scope ratio. Shaded portion indicates the range which has proved successful for the 400-mesh otter trawl during exploratory surveys.

As water currents and sea conditions warranted, ratios were altered from the average. For instance, when dragging against or across strong currents or when sea conditions were "lumpy" on the shallower grounds, high ratios were used.

When towing in deeper water with more cable out, the total drag was greater. Therefore, the engine r.p.m.'s were increased to maintain optimum fishing speed.

A quick means of determining the amount of cable needed to get a desired scope ratio is graphically presented in figure 2. By knowing the scope ratio which is desired at a particular depth, one simply follows this ratio line to determine the amount of cable needed at a particular depth in order to get the desired ratio.

It should be noted that the scope ratio data presented are empirical and that no calculations were used to determine optimum values. Therefore, they do not necessarily represent the maximum or minimum which could be used successfully.

LITERATURE CITED


ALVERSON, DAYTON L.
1951. Deep-Water Trawling Survey Off the Coast of Washington (August 27-October 19, 1951). Commercial Fisheries Review, vol. 13, no. 11 (November), pp. 1-16. (Separate No. 292.)

BULLIS, H. R.
1951. Gulf of Mexico Shrimp Trawl Designs. U. S. Fish and Wildlife Service, Fishery Leaflet 394 (September), 16 pp.

de BOER, P. A.
1957. Trawl Gear Measurements Obtained by Underwater Instruments. Modern Fishing Gear of the World, Fishing News (Books) Ltd., London, pp. 225-233.

ELLSON, J. G.
1950. The Exploratory Fishing Vessel John N. Cobb. U. S. Fish and Wildlife Service, Fishery Leaflet 385 (October), 11 pp.

_____, and ROBERT LIVINGSTONE, Jr.
1952. The John N. Cobb's Shellfish Explorations in Certain Southeastern Alaskan Waters, Spring 1951. Commercial Fisheries Review, vol. 14, no. 4 (April), pp. 1-20. (Separate No. 311.)

GOUROCK ROPEWORK CO. Ltd.
1961. Deep Sea Trawling and Wing Trawling. The Gourock Ropework Co. Ltd., Port Glasgow, Scotland, 106 pp.

GREENWOOD, MELVIN R.
1958. Bottom Trawling Explorations off Southeastern Alaska, 1956-1957. Commercial Fisheries Review, vol. 29, no. 12 (December), pp. 9-12. (Separate No. 398.)

KULLENBERG, B.
1951. On the Shape and Length of the Cable During Trawling. Report of the Swedish Deep Sea Expedition, vol. 2, Zoology, no. 2, pp. 30-44.

MIYAMOTO, H.
1957. On the Relation Between Otter Trawl Gear and Towing Power. Modern Fishing Gear of the World, Fishing News (Books) Ltd., London, pp. 248-250.

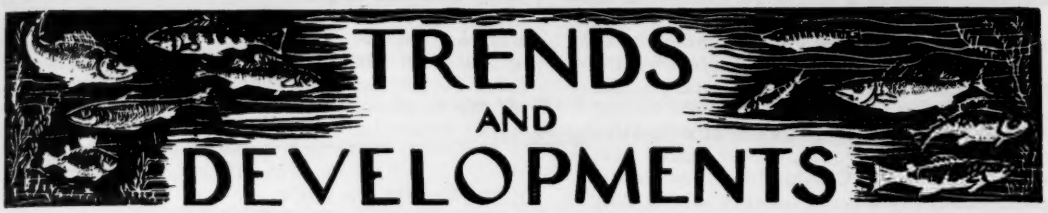
PODE, LEONARD
1950. A Method of Determining Optimum Lengths of Towing Cables. Navy Department, The David W. Taylor Model Basin, Report 717 (April), 14 pp.

1951. Tables for Computing the Equilibrium Configuration of a Flexible Cable in a Uniform Stream. Navy Department, The David W. Taylor Model Basin, Report 687.

SAITO, ICHIRO
1957. Studies on the Fishing Ground, Fishing Gears, and Fishing Technique in One-Boat Medium Trawl Fishery. Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 5, no. 1.

SCHAEFERS, EDWARD A., and HAROLD C. JOHNSON
1957. Shrimp Explorations Off the Washington Coast, Fall 1955 and Spring 1956. Commercial Fisheries Review, vol. 19, no. 1 (January), pp. 9-25. (Separate No. 465.)

WATHNE, FREDERICK
1959. Observations on Trawl-Door Spread and a Discussion of Influencing Factors. Commercial Fisheries Review, vol. 21, no. 10 (October), pp. 7-15. (Separate No. 563.)




## Alaska

FOREIGN FISHING ACTIVITIES IN BERING SEA AND GULF OF ALASKA:

There was a progressive reduction in the number of foreign fishing vessels operating in the Bering Sea and Gulf of Alaska during September 1963, mainly with the Japanese. Several of the long-line fleets were reportedly scheduled to have returned to Japan. By month's end an estimated 130 Japanese and 70 Soviet vessels were believed to be fishing in the Bering Sea and Gulf of Alaska.

Most of the Soviet trawl fleet moved south from the Portlock Bank area until major efforts were concentrated on Albatross Bank east of Kodiak Island. That fleet appeared to be the bulk of the Soviet fishing effort and was composed of about 30 SRT trawlers, 2 SRT-R trawlers, 3 BMRT trawlers, 8 refrigerator ships, and a few support vessels.

Japanese fisheries efforts were rapidly drawing to a close in the Bering Sea as vessels departed for the home islands. The two king crab fleets reportedly may extend their scheduled departure dates as they were behind in their quota. The Japanese fleet in waters adjacent to Alaska during September was estimated to be about 130 vessels of all types.

Foreign fishing activities off Alaska were curtailed even more by mid-October. From a high of more than 400 Soviet and Japanese vessels engaged in the fisheries during July, the foreign fleet strengths dwindled to about 45 vessels in October. Shrimp fishing north and west of the Pribilof Islands was then the sole remaining Japanese fishery in the eastern Bering Sea. Nearly 200 other Japanese vessels which were harvesting king crab, whales, Pacific ocean perch, cod, and flatfishes returned to their home bases. Japanese operations in the Gulf of Alaska during October were restricted to two stern ramp factory trawlers fishing off southeast Kodiak Island. Observations of those trawlers showed they were catching mainly Pacific ocean perch and that they were intermittently serviced by various types of support vessels.

The Soviet trawling fleet operating near Kodiak Island in October had diminished to less than 15 vessels, in contrast to over 150 vessels in the same area during July. It was anticipated that the Soviets will follow a pattern similar to previous years, returning to fish the eastern Bering Sea later in the winter when the edges of the pack ice have advanced to the fishing grounds and can be used for protection from the frequent storms in that area.

* * * * *

SOVIET TRAWLERS AGAIN FORCE ABANDONMENT OF KODIAK KING CRAB GROUNDS:

In September 1962 Soviet trawlers invaded grounds off Kodiak being fished by United States king crab fishermen. The resulting losses of stationary king crab pot gear to mobile Soviet trawls generated a storm of protest from United States fishermen, congressional delegations, and the press. High losses of expensive crab pots caused many fishermen to make threats of armed retaliation. However, there was no evidence that the Soviet fishermen were taking any species other than Pacific ocean perch.

In September 1963, a similar situation arose when Soviet trawlers moved inshore and began bottom trawling around and through United States crab fishermen's gear. This time, however, the evidence appeared conclusive that the Soviets were taking king crab in commercial quantities in the vicinity of Alitak Bay and the Trinity Islands south of Kodiak.

* * * * *

SOVIET VESSELS LEAVE CRAB GROUNDS WHEN U. S. PATROLS ARRIVE:

Alaskans aboard the United States king crab vessels stated that the Soviets were de-

liberately damaging and destroying gear used by the Americans. It was reported that the Soviets appeared to be very blatant about it and seemed completely undisturbed by the presence of a U. S. Coast Guard patrol aircraft flying overhead observing and taking photographs of their harassment activities. United States fishermen, Coast Guard personnel, and Bureau of Commercial Fisheries agents observed Soviet vessels taking king crab. Documented evidence and films of the Soviet operations were forwarded to Washington, D. C.

The Coast Guard Cutters Winona and Storis were dispatched from the Bering Sea Patrol to the scene, with the Winona arriving there on September 7 and the Storis on September 8. When the Winona arrived, the staff aboard found United States and Soviet vessels intermingling in the international waters west of Low Cape on the south end of Kodiak Island. Soviet fishing vessels left the immediate area off Kodiak on September 7 when the Coast Guard Cutter Winona appeared on the scene. United States crab fishermen were indignant at the apparently deliberate and ruthless destruction of their expensive gear and a sense of impending violence could be felt in the Kodiak area as threats reached fever pitch.

* * * * *

U. S. PROTESTS SOVIET KING CRAB TRAWLING OFF KODIAK ISLAND:

The State Department advised Alaska's Governor that it had lodged a protest with the Soviet Embassy in Washington over Soviet trawling on United States king-crab fishing grounds off Kodiak Island. The Deputy Under Secretary of State, informed Governor Egan in a wire that the matter had been taken up with the Soviet Embassy and that they had agreed to take the complaint to Moscow immediately. (Alaska Empire.)

* * * * *

FOREIGN FISHING FLEETS TARGET OF KODIAK MEETING:

Kodiak fishermen met with the Alaska Attorney General on September 14 concerning their complaints that Soviet fishermen were interfering with the Kodiak king crab vessels. Eight captains of fishing vessels who had difficulty with the Soviet trawlers were flown to Kodiak for public hearings in the District Magistrate's court. The meeting was called to allow the Attorney General to gather testimony and was organized by the Kodiak Island Advisory Committee to the Alaska Board of Fish and Game. The Kodiak crab industry appealed to Alaska's Governor for support after Soviet vessels entered king crab waters off the southwest tip of Kodiak.

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BERING SEA PATROL ACTIVITIES DIMINISHED:

Fisheries patrols in the Bering Sea and Gulf of Alaska were reduced with the depar-

Bureau's research vessel John R. Manning.

ture of the Coast Guard Cutter Winona for her home port of Port Angeles, Wash. The Winona completed the final tour of intensified patrol which began with the Cutter Wachusett and was continued by the Klamath. The Coast Guard Cutter Storis was scheduled to complete the final phase of the joint Bureau of Commercial Fisheries-Coast Guard fisheries patrol on October 1. The Bureau's research vessel John R. Manning was dispatched to the Kodiak king crab grounds to augment the diminished Coast Guard surface patrol. Plans call for the assignment of two additional Coast Guard surface vessels on a rotational basis from October through December 1963, to maintain patrol of the king crab-fishing area off southwest Kodiak.

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INTER-AGENCY SALMON COUNCIL REVIEWS STATUS OF PACIFIC SALMON:

The third meeting of the Inter-Agency Salmon Council Technical Committee was held in Portland, Oreg. Members from all of the

U.S. Pacific states and regions presented initial drafts of salmon status reports for their respective regions. Alaska's assignment included Karluk, Bristol Bay, Peninsula, and Aleutian Chain salmon runs. The reports are adapted to a simple format and will be combined to allow the salmon administrators to see at a glance the past and present condition of the important Pacific salmon runs.

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FISH PROCESSING ADVICE AVAILABLE FROM BUREAU'S KETCHIKAN TECHNOLOGICAL LABORATORY:

Information on subjects such as a home preservation method for raw seal oil, making seafood products from seaweed, sea urchins, sea cucumbers, or a method for preparing sturgeon, is provided by a U.S. Bureau of Commercial Fisheries technical advisor to the Alaska fishing industry. The technical advisor makes his headquarters at the Bureau's Technological Laboratory in Ketchikan and his job is to provide expert advice on processing methods--canning, freezing, curing, smoking--to Alaska's commercial processors. To provide this service, he visits processors to answer their questions, to observe their procedures, and to offer constructive criticism.

In addition to advisory services, limited applied research is conducted to solve specific processing problems revealed on field trips. One vexing problem in king crab is to develop canning procedures that will enable producers to more accurately predict the processed weight of crab meat in a can for a given raw meat input. For this purpose crab-canning experiments are in progress at the Ketchikan laboratory.

Alaska seafood processors may contact the U.S. Bureau of Commercial Fisheries Technological Laboratory, 622 Mission Street, Ketchikan, Alaska, with their questions and processing problems. Solutions to technological questions may not always be readily available but prompt replies to all inquiries will be made.

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CRAB CATCH PROMISING FOR 1963:

According to data tabulated by the Alaska Department of Fish and Game, the king crab catch totaled 33.5 million pounds for the period January-July 1963. The catch of Dungeness crab totaled about 5 million pounds for the same period. Data on the catches for a comparable period in 1962 are not available. However, indications are that the 1963 Alaska crab catches will exceed the record king crab catch of 52.8 million pounds and the record Dungeness crab catch of 9 million pounds in 1962.

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ALASKA CANNED SALMON COMPARISONS:

The total pack of salmon in 1963 will be about 2,676,000 cases, down approximately 734,000 cases or 22 percent when compared with the total 1962 pack of 3,410,000 cases. Southeastern Alaska's pack totaled 1,185,000 cases, in 1963, up 277,000 cases or 30 percent compared with the 1962 pack of 908,000 cases. Central Alaska packed 1,200,000 cases in 1963, down 789,000 cases or 40 percent from the 1962 pack of 1,989,000 cases. Western Alaska packed 291,000 cases in 1963, down 223,000 cases or 43 percent from the previous year's pack of 514,000 cases.

The percentage composition of the Alaska salmon packs by species for the last 3 years were:

Percentage Composition of Alaska Salmon Pack, 1961-63

| Species | 1963 | 1962 | 1961 |
|---|---|---|---|
| | | (Percent) | |
| Kings | 1.5 | 1.3 | 1.7 |
| Chums | 15.5 | 19.9 | 16.3 |
| Pinks | 60.2 | 54.1 | 39.1 |
| Reds | 18.1 | 21.6 | 40.4 |
| Cohos | 4.7 | 3.1 | 2.5 |

* * * * *

SOUTHEASTERN ALASKA SALMON FISHERIES:

Most salmon canneries in the Ketchikan area of Southeastern Alaska closed for the 1963 season after small packs of only 40 to 70 thousand cases. These results were in sharp contrast to the very good seasons enjoyed by the canneries in the Northern panhandle and on the West Coast of Prince of Wales Island where packs generally exceeded 100 thousand cases per plant. A number of seine boats of the Alaska fleet traveled south in 1963 to fish in Puget Sound where a very good seining season had been predicted. This movement extended the seasonal use of those vessels for several weeks and added needed income to several fishing communities. Late reports were that results were modest and most boats were to have returned to Alaska by October 1.

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ALASKAN SHRIMP FISHERIES AT CROSSROADS:

Shrimp processors at Seldovia closed up their 1963 seasonal operation after reporting an increase in production of about 10,000 cases over the previous year's 35,000-case pack. At Seward, the firm producing shrimp logs was terminating operations until possibly March 1964 due to marketing difficulties. Other shrimp producers either closed shop or were producing at a restricted volume. One exception was a plant at Kodiak which has active plans to enter shrimp production concentrating on side-stripe shrimp which are of larger size than the small Alaskan pinks. Tentative plans are to pay the fishermen 10 cents per pound for the side-striped shrimp. This increase of 6 cents per pound over the price paid for pink shrimp is hoped to be sufficient to compensate for catch rates that are expected to be considerably lower than can be realized when fishing for the pinks.

Waterfront rumors attribute the low cost of the Japanese shrimp for much of the difficulties that the Alaskan producers are facing. Other factors such as the increased production of Indian shrimp, and the competition from higher quality domestic production are not often heard.

* * * * *

NEW FIRM PLANNED FOR JUNEAU AREA:

A newly formed corporation plans to process king crab, Dungeness crab, shrimp, and other seafoods in the Juneau area. The company will continue operations started in 1962 by another firm. The newly formed corporation hopes to purchase an old cannery at Douglas to house processing facilities and a cold-storage facility to handle the production of about ten fishing vessels. The management expects to employ about 25 to 30 plant workers.

* * * * *

NEW FISHWAY ON KODIAK ISLAND OPENS LARGE SPAWNING AREA FOR SALMON:

Completion of the Frazer Fishway on Kodiak Island has made accessible to salmon one of the greatest potential red salmon producing areas in western Alaska, according to an announcement by the Commissioner of the Alaska Department of Fish and Game.

The fishway, constructed around the 33-foot Frazer Falls, opens up a 5,000-acre rearing area in the 72-square mile Frazer Lake watershed. The falls had been an impassable barrier for salmon to the large basin.

Biologists of the Department estimate that the once barren waters could produce as many as three million red salmon a year if all optimum conditions were met. It is expected, however, that the average yearly production will fall somewhat under that figure even after a population of optimum numbers of spawning salmon has been built up. This will probably take a period of years.

The portable aluminum steep-pass used on the project was developed by the Director of Engineering for the Alaska Department. It was the first practical application of the adaptation of a lightweight shop prefabricated fishway that could be flown out to a remote area and bolted together on the spot. (Alaska Department of Fish and Game, October 15, 1963.)

Department biologists have stocked Frazer Lake since 1951, 12 years prior to the construction, by various methods including eggs and spawning adult salmon. To date, the transportation of adult fish from Red River Lake has proven the least expensive and most feasible method. The adult fish which returned to Frazer this year were the result of plants of eyed-eggs obtained from Karluk Lake five years ago.

The purpose of the egg plants was twofold: (a) to determine whether Frazer Lake could raise red salmon satisfactorily; and (b), to build up a brood stock that would be established by the time money was available for laddering the falls. The topographic survey to select the best route for laddering the falls was made in July 1957.

Two steep-pass fishways designated as A and C were installed side by side so that a comparison could be made of their over-all performance. The A type with vertical baffles was first developed in 1957. It produces a cascading tumbling type of water action somewhat slower than C's which produces a streaming type flow over baffles that have a 30 percent slope.

Even without the completion of the effective leads to guide the salmon into the ladder, which are scheduled for completion next spring, the fishpass was ascended by 2,500 red salmon and 3,000 pink salmon into Frazer

Lake during 1963. Of the red salmon, 65 percent preferred the A and 35 percent the C. Sixty-eight percent of the pinks used the C and 35 percent the A.

The original concept for a steep-pass of this type was developed in Europe, the Director of Engineering for the Alaska Department said. It never caught on in the United States because many early experimenters failed to fully comprehend its basic operating principles. The Engineering Director feels that it is with blocks of up to 10 feet of head that the steep-pass fishway will have its greatest application and that the 33 feet lift in 4 steps at Frazer Falls approaches its upper limits of economic usefulness.

He does not intend the steep-pass to be a substitute for more conventional fish ladders such as those employed on the Columbia River. It was developed by the Department as an effective solution for installation at the host of low control barriers in wilderness areas where conventional construction would be difficult and expensive. Such projects are in line with the State's program of enhancing our fisheries resources by improving and extending the habitat for our salmon thus providing more fish for the future, the Commissioner of the Alaska Department of Fish and Game stated.

## Alaska Fisheries Investigations

KARLUK RED SALMON SPAWNING ESCAPEMENT HIGH FOR 1963:

In spite of heavy August commercial fishery in the Karluk lagoon, the 1963 red salmon escapement into Karluk Lake was over 371,000 fish by mid-September. This will constitute a high spawning level in comparison with recent years, although over 500,000 red salmon spawned in the Karluk system in 1962. The usual fall spawning distribution occurred where most of the September spawners were observed in the terminal streams and on the lake beaches.

* * * * *

BROOKS STATION ECOLOGY STUDIES:

Limnological and trace element experiments were continued at Brooks Station staff during September 1963. Early results suggest that deficiencies in cobalt, lithium, manganese, molybdenum, and vanadium are at times limiting primary productivity. Lake water sampling for detailed analyses was completed. The array of red salmon lakes sampled in 1963 are Nonvianuk, Kukaklek, Coville, Grosvenor, Iliuk Arm, Naknek Lake in South Bay and North Arm basins, Brooks, Becharof, Upper and Lower Ugashik, and Karluk.

Studies on young red salmon and stickleback utilizing holding pens in Brooks Lake have been under way in 1963. A careful inventory in early September showed that mortalities of both species have been quite low. Initial comparison of fish from the different pens seems to indicate that intraspecific competition and not interspecific competition has influenced the growth of the young sockeye.

Sockeye salmon adults from three major spawning waves were captured and the eggs spawned artificially. Over 100 Vibert plastic boxes were buried at specific times, each with 150 eggs. These egg samples have been recovered systematically after known calendar and thermal history. A set of preserved early embryological stages by 10 TU (Centigrade Temperature Units) stages is nearly complete to the 300 TU stage. Boxes will be systematically recovered up to time of fry hatching. A thorough description of the macro and micro embryological development of the sockeye salmon is scheduled on the basis of these samples. Of greater importance is the utility of this information in determining the effects of superimposition. This phase of the egg study will be conducted in late October following the termination of spawning in Brooks River.

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COMMERCIAL SIZED KING CRAB MALES SCARCE ON ALBATROSS AND PORTLOCK BANKS:

The tagging of king crabs aboard the U. S. Bureau of Commercial Fisheries research vessel John R. Manning continued until she was assigned to other duties in mid-September. In one month's effort, only about 600 males were tagged out of 3,500 crabs captured. Large numbers of females were taken in pots, especially on Albatross Bank. Trawling for crabs was not as productive as pot fishing. Severe storms hampered the operations in early September.

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SOUTHEAST ALASKA PINK SALMON RUN SHOWS UNEXPECTED OCEAN MORTALITY:

The total escapement of pink salmon to Sashin Creek at Little Port Walter was about 17,000, representing only 0.3 percent survival of the 5.94 million fry counted from the stream in spring 1962. Based on relationships between numbers of fry migrating to sea in previous years and numbers of adults returning, between 50 and 100 thousand adults were expected. Causes of the unusually high marine mortality are unknown. It would appear, however, that marine mortality may have been density dependent and that herring predation, which was observed in other brood years, was not the major factor because few herring were observed in the area in spring of 1962.

Using Little Port Walter as a base of operations, two weeks were spent in early September fishing for juvenile pink salmon with longline and floating surface round haul seine. The longline was effective for juvenile coho salmon, but not for pink salmon.

* * * * *

YOUNG PINK SALMON DISCOVERED MOVING TOWARDS OPEN OCEAN IN LARGE CONCENTRATION:

A concentration of immature pink salmon estimated to number in the millions was discovered near Little Port Walter and followed for 50 miles along the west shore of lower Chatham Strait. The rate of migration of this immense school gradually accelerated from 2½ miles a day to over 6 miles a day during the final 3 days of observation. Pink salmon in this vast school ranged in body length from 125 to 220 millimeters. The most successful technique for catching them was on the flood tide near shore. Migrating schools were found to be at or near the surface and could be easily discovered by the jumping of individuals out of the water. The population of young salmon seemed to be transported seaward by the movement of tides. During the flood tides, they maintained their position relative to land; whereas during the ebb tides, they allowed themselves to be carried along by the outgoing water.

Chum salmon juveniles comprised 5 to 10 percent of the salmon schools caught in the seine and averaged from 135 to 195 millimeters in body length. This is the first known instance in which juvenile salmon of this age have been successfully observed and caught in large numbers, and the fishing technique developed represents a major advance in the quest for knowledge of salmon. Detailed studies on these early marine stages will be necessary to understand large unexpected ocean mortalities such as occurred with the present adult run at Little Port Walter.

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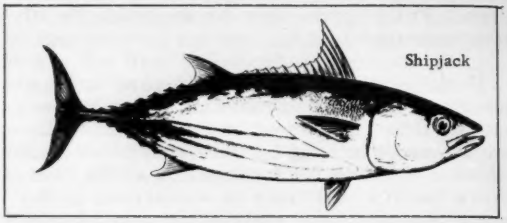
WARM-OCEAN FISH APPEAR IN ALASKA:

In addition to the occurrence of the Pacific bonito in Alaskan waters during the summer of 1963, a large 700-pound leatherback turtle was caught in the region of Cordova, a basking shark was taken in the vicinity of




Haines, and skipjack tuna appeared in the region of Controller Bay. All are indicative of an incursion of warmer southerly or southeasterly waters into the Gulf of Alaska during the summer. The basking shark occurrence may not be as rare as it seems because there have been previous reports of similar sharks in the region. That species is recorded as entering the Gulf of Alaska, but there is no actual documentation of it.

## American Samoa

MORE KOREAN TUNA VESSELS FISH OUT OF AMERICAN SAMOA:

The second United States tuna cannery now in operation at American Samoa is reported to have several Korean tuna-fishing vessels delivering tuna to its plant. Japan is concerned over this trend on the part of the two United States tuna-processing plants at American Samoa. These firms appear to be relying more and more on Korean tuna vessels to provide their raw tuna supply. This trend, reportedly, is accelerated in part by the difficulty the United States firms are experiencing in attracting sufficient numbers of Japanese ice vessels to fish for them.

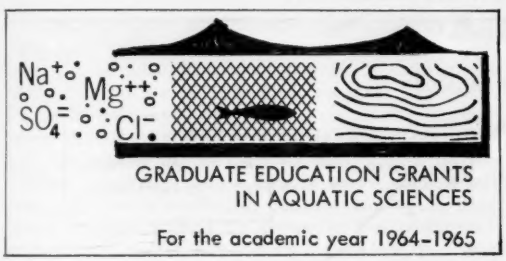
Japanese ice vessel operators are said to be reluctant to fish out of Samoa since they

must travel great distances to the fishing grounds (due to dwindling catches in nearby waters). As their vessels are equipped to hold only fresh fish, they cannot operate efficiently. To solve this problem, they are reported to be seeking permission from the Government to equip their vessels with refrigeration. (Nihon Suisan Shimbun, October 4, 1963, and other sources.)

## Aquatic Science Fellowships

UNIVERSITIES INVITED TO PARTICIPATE IN EDUCATIONAL PROGRAM:

The Bureau of Commercial Fisheries, Fish and Wildlife Service, U. S. Department of the Interior, invites applications from colleges and universities for Graduate Education in Aquatic Sciences for the academic year 1964-65.




Applications will be considered only from institutions of higher learning that offer a full-time curriculum leading to the doctorate degree. Application should be made by an authorized officer of the institution. Individual students should not apply to the Bureau. They will be selected by their institutions. Students may be selected any time prior to the beginning of the school year by institutions awarded grants.

Grants may be made in support of students working toward the doctorate degree in a broad series of disciplines related to the study of the ocean, lakes, or rivers, and their natural resources. The number of grants awarded in each discipline will be determined on the basis of anticipated needs and available funds. The following subjects are among those that will be considered for support. Awards may be made in the other fields of study, if funds are available.

Physical Oceanography[1/]
Biological Oceanography[1/]
Marine Biology and Ecology[1/]
Taxonomy (especially invertebrate)[1/]
Fishery Biology (especially with training in biometrics)[1/]
Food Technology (especially chemistry of fish oils)[1/]
Fishery Economics[1/]
Chemical Oceanography
Geological Oceanography
Meteorology (oceanographic)
Oceanographic Instrumentation (including engineering)
Limnology

Grants will include:

(1) $3,000 cost of living allowance for the students;
(2) $1,000 additional cost of living allowance for married students with children;
(3) Tuition and fees; and
(4) $500 annual administrative allowance to the institution.

Grants will be awarded for one year on a 12-month basis. They may be renewed in the name of the incumbent for additional one-year periods upon certification of satisfactory progress. Grants currently in effect, which were awarded for 2 years, are not affected by the shift to annual awards.

1/Fields of primary interest which will receive priority in making awards.

## Atlantic States Marine Fisheries Commission

ADOPTS RESOLUTION CALLING FOR A 12-MILE FISHING LIMIT:

The Atlantic States Marine Fisheries Commission, at its 22 Annual Meeting in Boston, Mass., September 23-26, 1963, adopted a resolution calling for the extension of United States coastal jurisdiction over fisheries to 12 miles. Such an extension, the resolution stated, "has much to recommend it in terms of providing a better base for sound management of fisheries adjacent to a nation's coast, and in recognizing the particular stake of the coastal nation in such fisheries." The text of the resolution (in part) follows:

". . .Be It Resolved, That the Atlantic States Marine Fisheries Commission go on record as favoring the extension of the United States coastal jurisdiction over fisheries to 12 miles and the extension of the jurisdiction of the states to the same extent as the federal jurisdiction is extended, and direct its officers and staff to present this position as forcefully as possible to the President of the United States, the Secretary of State, and the appropriate Congressional leaders. . . ."

## California

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 63-A-6 (September 6-25, 1963): The objectives of this cruise by the California Department of Fish and Game research vessel Alaska off the Mexican coastal waters of Baja California between Isla Cedros and Punta San Carlos were to:

(1) Survey the fish and invertebrates in the inshore pelagic environment;

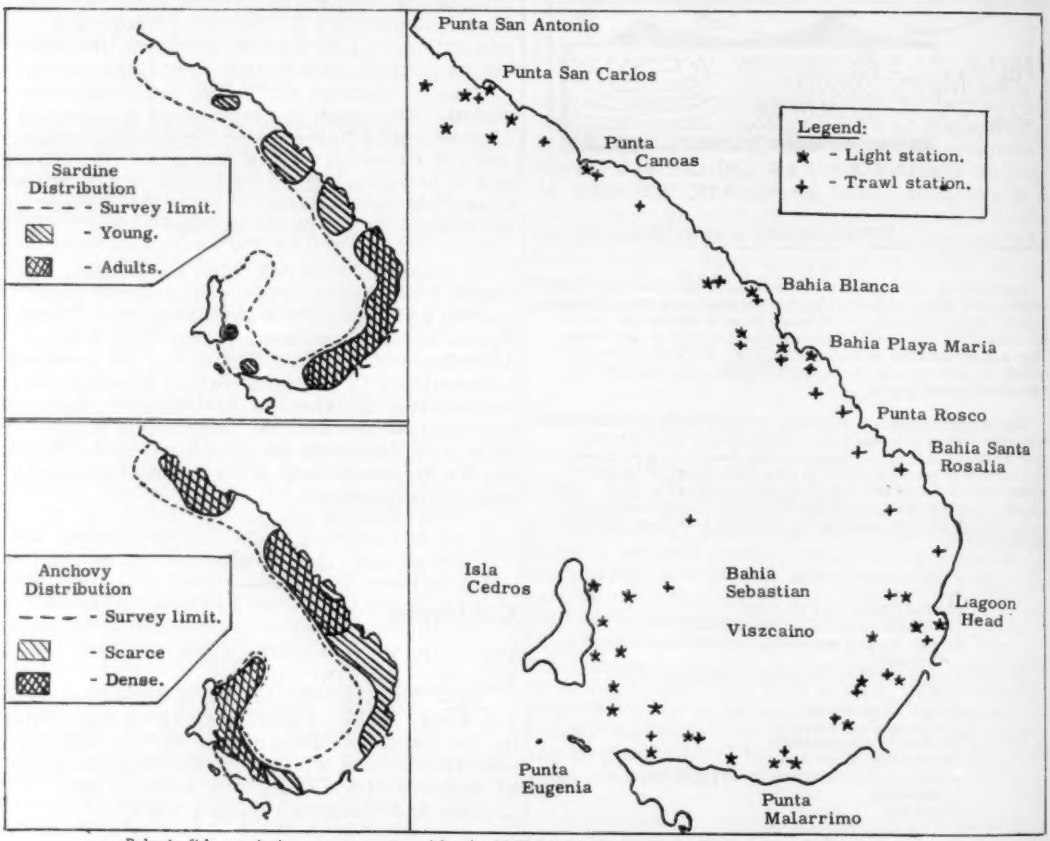
(2) Assess recruitment from this year's spawning of Pacific sardines (Sardinops caeruleus) and to measure the population density of older fish;

(3) Collect live sardines for serology studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory at La Jolla, Calif., and;

(4) Continue comparing midwater-trawl and blanket-net catches.

A midwater-trawl was the major sampling tool used during the survey; however, blanket-net, night-light fishing was carried out in selected areas as a check on trawling and to collect live sardines. Twenty-five midwater-trawl stations and 32 night-light stations were occupied. All survey work was conducted at night.

PACIFIC SARDINES: Sardines were taken at 26 of the 57 stations occupied on the cruise. Adults were abundant in a limited portion of Bahia Sebastian Vizcaino. Between Punta Malarrimo and Bahia Santa Rosalia, adults were present at 8 of 9 trawl stations and 8 of 10 night-light stations. Adults were abundant in part of Bahia Sebastian Vizcaino in 1962, but their distribution was more restricted. Most fish were from 160-200 millimeters (6.30-7.87-inches) in length and were either in an advanced stage of maturity or spent. A few running-ripe females were noted. About 500 sardines were delivered alive to the U. S. Bureau of Commercial Fisheries, Biological Laboratory at La Jolla for serological studies.




Pelagic fish population survey continued by the M/V Alaska Cruise 63-A-6 (September 6-25, 1963).

Young sardines (1963 year-class) mixed with northern anchovies (Engraulis mordax) were taken at several stations between Punta Rosco and Bahia Blanca, but made up only a small proportion of the catch. Nevertheless, the catches were significant because young sardines were completely absent in that area last year.

During the cruise, adult sardines were taken at 7 trawl and 9 night-light stations; young sardines at 6 trawl and 2 night-light stations; and mixed adult and young at 2 trawl stations. Since a midwater trawl was used extensively, the results of the survey are not directly comparable with past surveys, but the high percentage of successful sardine stations and the consistency from station to station are more reminiscent of surveys made in the early 1950's than those of recent years.

ANCHOVIES: Anchovies, particularly young fish, were abundant in the survey area. The juvenile anchovies were especially numerous along the inside of Isla Cedros and between Punta Rosco and Bahia Blanca on the mainland. Adult anchovies were taken in quantity only between Punta Canoas and Punta San Carlos, although a few adults were mixed with young at some stations. Anchovies were also taken with sardines at some of the inshore stations in Bahia Sebastian Vizcaino, but not in quantity.

Adult anchovies were taken at 3 trawl stations; juvenile anchovies were taken at 12 trawl and 10 light stations; and mixed adults and juveniles were taken at 4 trawl stations.

PACIFIC MACKEREL: Pacific mackerel (Scomber diego) were taken at scattered locations throughout the area. They were caught at 4 trawl and 6 light stations and were particularly abundant at some stations close to shore. On several occasions, they were noticed around the vessel during daytime anchorage. Most of the fish were young adults, ranging from 250 to 300 millimeters (0.98-1.18 inches) in length.

JACK MACKEREL: Jack mackerel (Trachurus symmetricus) were taken in 8 trawl tows, but at only 2 light stations. The catches were generally small and scattered throughout the survey area. All were juvenile fish.

ROUND HERRING: Round herring (Etrumeus teres) were taken quite frequently in the same area as sardines. Round herring are generally considered to be more adept than sardines at avoiding the blanket net or the night light. This was borne out by the appearance of round herring in 13 midwater-trawl tows but in only 1 light-station catch.

VISUAL SCOUTING: A total of 227 miles were scouted while running between stations at night. Few schools were seen even in areas where many fish were caught. A total of 7 schools of sardines were seen in the southern part of Bahia Sebastian Vizcaino, and 2 more near Bahia Blanca. Anchovy schools were seen only in the northern part of the survey area. A total of 17 anchovy schools were counted near Punta San Carlos where adult fish were trawled. A continuous, thin surface scatter of juvenile anchovies was often seen while running between stations, but no schools were evident.

MISCELLANEOUS OBSERVATIONS: Two observers from the Instituto Nacional de Investigaciones Biologico--Pesqueras, Mexico City, Mexico, joined the cruise at Ensenada.

Sea surface temperatures, ranged from 18.6° C. (65.5° F.) at Punta Canoas to 25.0° C. (77.0° F.) near Punta Eugenia.

The water was very clear, with photometer readings between 90 and 100 (scale 0-100) throughout most of the cruise area. Turbid water was encountered around Punta San Carlos where an inshore photometer reading of 28 was obtained and offshore readings in the 70's were the rule.

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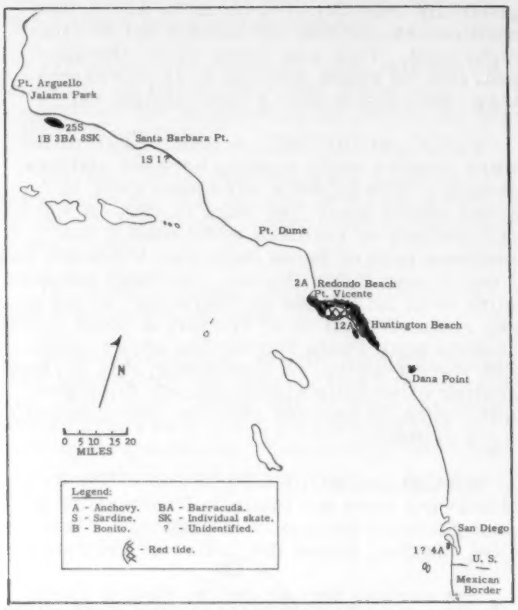
Airplane Spotting Flight 63-9-Pelagic Fish (September 23-25, 1963): To determine the inshore distribution and abundance of pelagic fish schools, the inshore area from the United States-Mexican Border to Bolinas Point, Calif., was surveyed from the air by the California Department of Fish and Game's Cessna "182" 9042T.

On September 23, the area from Dana Point to Point Conception was scouted. Low clouds obscured the waters south of Dana Point and light haze prevailed to the north, but the area was visible from the air. There was considerable red tide in the area from Huntington Beach to the western portion of San Pedro Bay. Three small schools of Pacific sardine (Sardinops caeruleus) were




Airplane Spotting Flight 63-9-Pelagic Fish (September 23-25, 1963.)

sighted between Point Conception and Santa Barbara. By flying low over the water, many aggregations of 50-200 sardines also could be seen in the areas. Three schools of California barracuda (Sphyraena argentea) and one school of California bonito (Sarda chiliensis) were also sighted. Twelve schools of northern anchovies (Engraulis mordax) were seen in the Newport-Huntington Beach area and two off Redondo Beach.

On September 24, unfavorable flying conditions prevented an early departure and scouting was possible only in the San Diego area where four schools of anchovies were seen.

On September 25, 1963, the area from Bolinas Point to Santa Monica Bay was scouted. Water and air visibility were very good except in the waters north of Point San Luis, where heavy brownish phytoplankton blooms prevailed. Twenty-three small sardine schools were seen between Point Conception and Santa Barbara from an altitude of 1,500 feet.

Note: See Commercial Fisheries Review, November 1963 p. 21.

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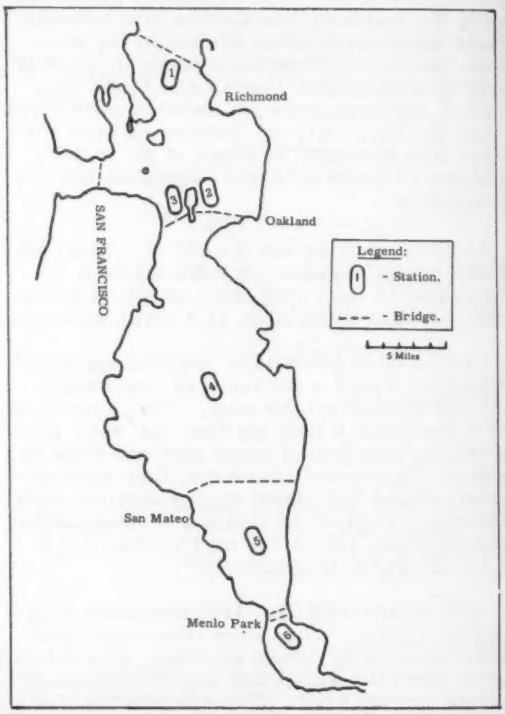
SAN FRANCISCO BAY INVESTIGATIONS CONTINUED:

M/V "Nautilus" Cruise 63-N3g-h S.F. Bay Study (August 19-23 and September 16-20, 1963): The study of San Francisco Bay south of San Pablo Bay by the California Department of Fish and Game research vessel Nautilus was continued in August and September 1963. The objectives were to: (1) collect fish and invertebrates routinely at six established stations to determine distribution and relative abundance under prevailing environmental conditions, (2) define ecological zones of the bay, and (3) determine food of the principal fish and its availability.

A square-mouthed midwater trawl 25 feet on a side was towed for 20 minutes at each station during sampling in August and September 1963. Each station was also sampled by a 15- to 20-minute bottom tow with a beam-trawl net 10 feet wide and 4 feet high with 1-inch mesh. A 40-foot Gulf shrimp trawl was




Shows collecting stations during San Francisco Bay study by M/V Nautilus.

Species of Fish Taken in San Francisco Bay during M/V Nautilus Cruise 63-N3g-h, August and September 1963

| Common Name | Scientific Name |
|---|---|
| Anchovy, northern | Engraulis mordax |
| Bass, striped | Roccus saxatilis |
| Croaker, white | Genyonemus lineatus |
| Flounder, starry | Platichthys stellatus |
| Goby, bay | Lepidogobius lepidus |
| Gunnel, saddleback 1/ | Pholis ornata |
| Herring, Pacific | Clupea pallasi |
| Jacksmelt | Atherinopsis californiensis |
| Lance, Pacific sand 1/ | Amnodytes hexapterus |
| Lingcod | Ophiodon elongatus |
| Midshipman, northern | Porichthys notatus |
| Midshipman, slim | Porichthys myriaster |
| Perch, black 1/ | Embiotoca jacksoni |
| Perch, pile | Rhacochilis vacca |
| Perch, shiner | Cymatogaster aggregata |
| Poacher, pricklebreast | Stellerina xyosterna |
| Ray, bat | Myliobatis californicus |
| Rockfish, brown | Sebastodes auriculatus |
| Salmon, king | Oncorhynchus tshawytscha |
| Sanddab, Pacific | Citharichthys sordidus |
| Sculpin, buffalo | Enophrys bison |
| Sculpin, staghorn | Leptocottus armatus |
| Shark, leopard | Triakis semifasciata |
| Shark, sevengill 1/ | Notorynchus maculatus |
| Smelt, whitebait 1/ | Allosmerus elongatus |
| Smoothhound, brown | Triakis henlei |
| Sole, English | Parophrys vetulus |
| Sole, sand | Psettichthys melanostictus |
| Tomcod, Pacific | Microgadus proximus |
| Topsmelt 1/ | Atherinops affinis |
| Turbot, hornyhead | Pleuronichthys verticalis |

1/Not taken in the bay during cruises in February, March, April, May, and June 1963.

used to make 3 hauls, but it appeared to fish less effectively than the beam trawl.

Temperature and salinity measurements were taken from both surface and bottom water where the depths were sufficient to make a measurable difference. At the shallow stations, only surface observations were made. Bottom water samples were collected with a modified Eckman bottle secured to the orange-peel dredge line two feet above the dredge. Temperature was measured to 0.1° C. and salinity to 0.1 o/oo.

Two nets were torn by fouling on submerged objects. Clear water, in which fish evade gear, made the total number of fish caught less than on previous cruises. Of 31 species collected, 6 were new to the study. A total of 49 species of fish have been taken since the current study of San Francisco Bay began in late January 1963.

Note: See Commercial Fisheries Review, Sept. 1963 p. 15.

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SURVEY OF SHRIMP RESOURCES IN NORTHERN AND CENTRAL COASTAL WATERS CONTINUED:

M/V "N. B. Scofield" Cruise 63-S-6: (August 29-September 24, 1963): The main objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield off central and northern California from Bodega Bay to the Oregon were to:

(1) Locate concentrations of pink shrimp (Pandalus jordani) for population estimates and a determination of natural mortality rates in Area A, B-1, and B-2 (figures 1-3);

(2) Determine sex ratio, year-class composition, and weight of shrimp in each area;

(3) Make bathythermograph and Nansen-bottle casts for bottom temperatures and water samples in productive shrimp areas;

(4) Count and weigh incidentally caught fish; and

(5) Collect fish and shellfish specimens for special study.

AREA A: Seventy 20-minute tows were made with a 41-foot head rope Gulf otter trawl between Trinidad and the Oregon border in 51 to 90 fathoms. In 2 widely separated

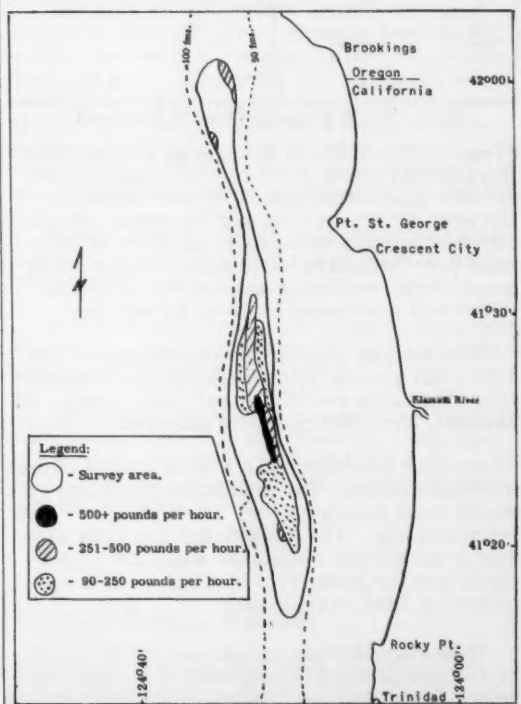


Fig. 1 - M/V N. B. Scofield Cruise 63-S-6, Area A.

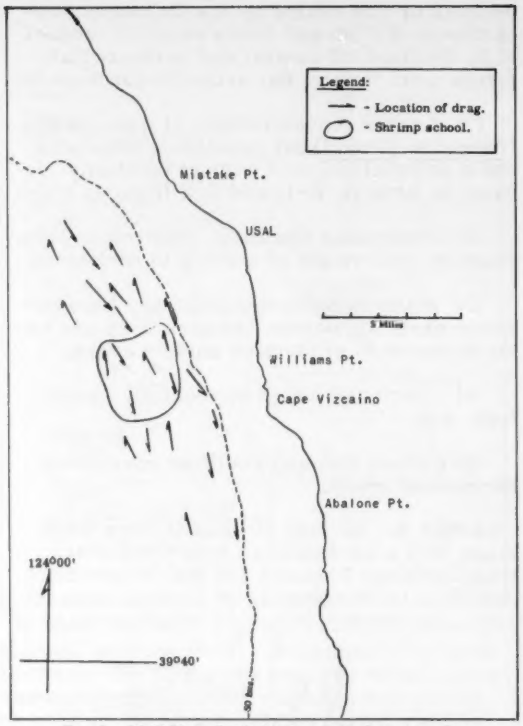


Fig. 2 - M/V N. B. Scofield Cruise 63-S-6, Area B-1.

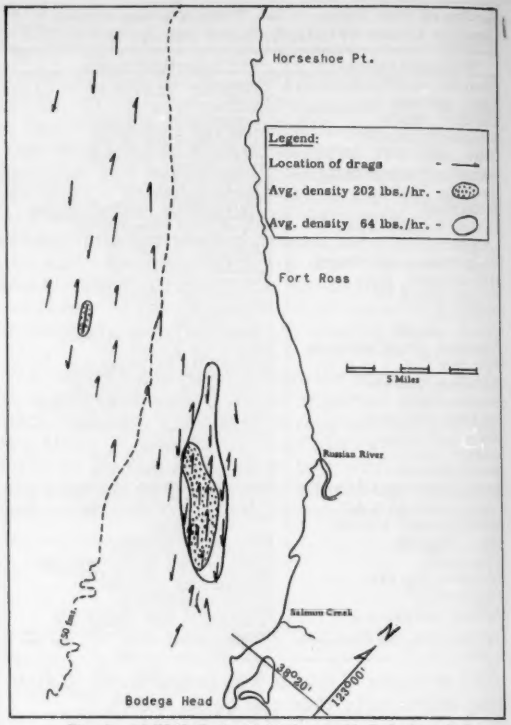


Fig. 3 - M/V N. B. Scofield Cruise 63-S-6, Area B-2.

areas between Point St. George and the Oregon border, there were limited commercial shrimp concentrations at 68 to 75 fathoms. Between Crescent City and Trinidad, low densities of shrimp were found at 58 to 85 fathoms in a 65-square-mile area. There were commercial densities west of the Klamath River and northward in 58 to 85 fathoms.

The shrimp population was estimated at 1,200,000 pounds with the following composition: 1962 class--28 percent, 1961 class--68 percent, and 1960 class--4 percent.

Natural mortality was high during the commercial season. The population had been reduced much below a level attributable to fishing mortality. The outlook for the 1964 season is not bright due to the weak 1962 year-class and the prospects of a below-average incoming 1963 year-class.

Heads-on shrimp counts ranged from 67 to 151 per pound and averaged 93. Eggs were developed in ovaries of 65 percent of the females.

Hake (Merluccius productus) dominated the fish catch. Slender sole (Lyopsetta exilis) and arrowtooth flounder (Atheresthes stomias) were taken at most stations.

Bottom water samples were taken at nine stations for salinity determinations. A total of 39 bathythermograph casts were made. Surface temperatures averaged 14.7° C. (58.5° F.); bottom temperatures averaged 9.0° C. (48.2° F.).

AREA B-1: Twenty-four 20-minute tows were made from Abalone Point to Mistake Point in 50 to 82 fathoms. Shrimp were found in light concentrations between 60 and 76 fathoms in an area covering 8.6 square miles off Cape Vizcaino and Williams Point. The average catch for 6 tows within that area was 62.5 pounds per hour and ranged from 45 to 105 pounds per hour. Based on those tows, the population within the area was estimated at approximately 45,000 pounds with the following composition: 1963 class--trace, 1962 class--58.7 percent; and 1961 class--41.3 percent.

Heads-on counts per pound averaged 94.5 with a range of 87 to 102. Shrimp of the year (1963 year-class) were present throughout much of the area. Ovary development was in the head-roe stage.

Bathythermograph casts were made at 18 stations and bottom water samples for salinity determinations were obtained from 9 stations. Bottom temperatures averaged 10.0° C. (50.0° F.) at 60 fathoms, and surface temperatures averaged 14.1° C. (57.4° F.).

Fish catches were light and no appreciable quantities of commercially important fish were caught. Hake were most common, and sablefish (Anoplopoma fimbria) were taken at five stations. The flatfish catch included slender sole, rex sole (Glyptocephalus zachirus), sand dabs (Citharichthys sordidus), and dover sole (Microstomus pacificus). Rockfish catches consisted mainly of stripetail (Sebastodes saxicola), darkblotch (S. crameri), greenstripe (S. elongatus), splitnose (S. diploproa), and occasionally chilipepper (S. goodei) and shortbelly (S. jordani).

AREA B-2: Forty-seven 20-minute tows were made from Bodega Head to Horseshoe Point in 29 to 68 fathoms. Shrimp were found in moderate density in 36 to 44 fathoms from due west of the Russian River to Salmon Creek. The school covered 9.2 square miles and extended for 8 miles. Six tows yielded catches ranging from 150 to 375 pounds per hour within an area of 3.8 square miles. Five tows, yielding an average catch of 64 pounds per hour, described an additional area covering 5.4 square miles. The population within the 9.2 square miles was estimated at 100,000 pounds. One tow, due west of the Russian River in 59 fathoms, produced 95 pounds in 20 minutes but the spot was found to be separate from the main concentration of shrimp.

Heads-on counts per pound ranged from 100 to 125 and averaged 112. The age-class composition was: 1962 class--60.6 percent, 1961 class--39.1 percent, and 1960 class--0.3 percent. Shrimp of the year (1963 class) were absent from all tows. Ovary development was in the head-roe stage, so no eggs were found on the pleopods.

Bathythermograph casts were made at 11 stations and water samples were taken at 8 stations. Bottom temperatures averaged 9.6° C. (49.3° F.) at 38 fathoms and surface temperatures averaged 11.5° C. (52.7° F.).

Many different species of fish were caught but there were no appreciable numbers of commercially exploited species. Flatfish were taken frequently. Rex sole were found at all stations. English sole (Parophrys vetulus), sand dabs, slender sole, and dover sole were found at most stations, while petrale sole (Eopsetta jordani) and arrowtooth sole were less common. Hake were caught in nearly every tow and sablefish were also commonly caught. Rockfish catches were very light, with most catches consisting of stripetail, darkblotch, and greenstripe rockfish. Commercially important copper rockfish (Sebastodes caurinus), canary rockfish (S. pinniger), and chilipepper were seldon caught.

Note: See Commercial Fisheries Review, July 1963 p. 32.

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ANNUAL SALMON SPAWNING SURVEY CONDUCTED:

The annual survey of salmon spawning stock on all the salmon streams in the Central Valley was started on October 1, 1963, by the California Department of Fish and Game.

The bulk of the State's salmon are produced in the area which extends from Redding south into the San Joaquin Valley. Fourteen fish and game assistants and fisheries men worked full time to gather the field information needed to estimate the number of king salmon spawners, their spawing success and distribution in the streams, and noted any adverse conditions affecting the salmon resource.

Aerial counts of individual spawning beds and of concentrations of spawning fish were also made.

Because salmon die after spawning, ground observers keep a count of spawned-out salmon carcasses to avoid duplication.

The survey furnishes much of the basic information needed by the State for managing the salmon resource, and provides data needed to evaluate water project developments that affect salmon.

## Canned Fishery Products

STRUVITE CRYSTALS ARE HARMLESS:

From time to time both industry and the U.S. Food and Drug Administration receive

reports from consumers who believe they have found glass in canned fish or shellfish, especially shrimp.

Examination, however, usually reveals it is not glass at all, but "struvite" (a crystalline magnesium ammonium phosphate) which occasionally forms in canned fish or shellfish from normally present constituents.

While struvite is not actually desirable, it does not affect the safety of the food. Canners have devoted considerable attention to the problem of struvite formation, but still have not been able to prevent it.

A simple test to distinguish between struvite and glass is to place the material in warm vinegar for a while. The struvite crystals will dissolve--glass, or course, will not.

## Cans--Shipments for Fishery Products, January-August 1963

A total of 2,114,241 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-August 1963, a decline of 4.4 percent from the 2,210,492 base boxes used during the same period in 1962. Most of the decline was due to a smaller pack of tuna in the first part of 1963.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 21.8 base boxes per short ton of steel. The use of aluminum cans for packing fishery products is small.

## Central Pacific Fisheries Investigations

### FACTORS AFFECTING ABUNDANCE OF SUMMER SKIPJACK TUNA IN HAWAIIAN WATERS:

A reexamination has been made of the annual forecast of abundance which the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu has been issuing to the Hawaiian skipjack tuna fishery.

Several years ago oceanographers and biologists at the Honolulu Laboratory noticed an apparent relationship between the pattern of changes in ocean water temperatures around Hawaii in the spring and the relative success of the ensuing summer fishery for skipjack tuna. Since the fishery is by far the most important in the Islands, and since the great year-to-year fluctuations in its landings seriously hinder the industry's production planning, the relationship was studied in the hope that it would provide a basis for predicting the availability of tuna before the start of the summer fishing season.

It was found that when the annual warming of the surface waters began earlier than usual, the year's landings were above average, while smaller than average catches were recorded in years of late warming. This relationship held good for every year for which suitable data on ocean temperatures were available, and the Laboratory began in 1959 to issue a yearly forecast to the fishing industry on this basis. Although the predictions were based on purely empirical evidence and the reasons for the association between time of warming and skipjack availability were not understood, the forecasts proved out for each year through 1962 and confidence in the method grew firmer.

On April 1, 1963, the Laboratory predicted an above-average skipjack catch for the year since the waters around the island of Oahu had begun to warm unusually early. But as the fishing season progressed, it became clear that catches were falling below the average level, and by the end of September 1963, the total catch was estimated to be only 7,325,000 pounds, or 1,352,000 pounds below the 1948-62 average for the period.

This failure of the skipjack to run true to form caused scientists at the Laboratory to make a review of oceanographic data for past years. It now appears that predictions of skipjack availability require an examination of more factors than had previously been thought necessary. There are in fact at least two major conditions which must be satisfied in order to justify a prediction of better than average fishing. First, the Hawaiian Islands must be surrounded by low salinity water of the California Current Extension type, which is considered to be the "home water" of the Hawaiian "season" skipjack. Secondly, the dynamic conditions must be such that there is early warming of the waters around the Hawaiian Islands. In retrospect, it appears that in making the 1963 forecast not enough weight was

given to the first of those factors, for although the temperature rise this spring indicated favorable dynamic conditions, the salinity has remained high.

A reexamination of data from past years now indicates that better than average landings were made in years when both factors were favorable. Poor catches marked the years when salinity was high and the spring warming of the ocean was late. In years when one or the other of the factors was unfavorable, catches were average or somewhat below average.

It is expected that the Honolulu Biological Laboratory will continue to make preseason forecasts of the availability of skipjack to the Hawaiian fishery. Future forecasts will be based on the more refined analysis that has resulted from this year's experience and should therefore be more reliable.

Note: See Commercial Fisheries Review, June 1963 p. 22.

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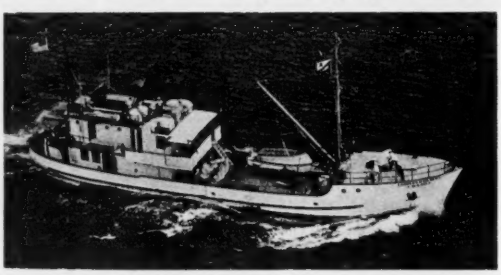
TUNA STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 69--Ahipalaha II: To find the spawning grounds of albacore tuna is the primary objective of this



Research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries.

long cruise in the South Pacific by the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert. The vessel sailed from Honolulu, Hawaii, on October 7, 1963, and is scheduled to return on December 20, 1963, after visiting Marakei Atoll in the Gilbert Islands; Suva in the Fiji Islands; Espiritu Santo, New Hebrides; Noumea, New Caledonia; and Pago Pago, American Samoa.

The purpose of the cruise is reflected in its designation because ahipalaha is the Hawaiian name for albacore tuna. The first survey in this series was made in the spring of 1962.

The expedition will fish with tuna longlines for mature albacore and will attempt to collect larval and juvenile specimens with plankton nets, trawls, and small-mesh gill nets. Aquaria were installed in the vessel so that small tuna may be kept alive for observation. Artificial fertilization and rearing experiments will be undertaken if ripe spawners are captured. Many details of the early development of tuna are not yet well known, and scientists are not in complete agreement on the identification of the smallest stages of some species.

A number of other projects will be carried out during the cruise. The stop at Marakei Atoll was scheduled in order to collect algae and fish for use in the poison fish studies of a scientist at the University of Hawaii. Samples of blood from tuna and marlin will be flown back to the U. S. Bureau of Commercial Fisheries, Honolulu Biological Laboratory from ports along the route for use in subpopulation studies. Drift cards will be released along the way to study ocean currents. Special requests have even been received for the flying fish that may come aboard the vessel at night and for the remoras (shark suckers) from sharks and marlin caught on longlines.

At Espititu Santo, where a Japanese tuna fishery is based, expedition members will consult with government and fishing company officials. In Noumea, conferences are scheduled with scientists of the Institut Francais d'Oceanie concerning cooperative research on tuna. The U. S. Bureau of Commercial Fisheries now maintains a field laboratory at Pago Pago in American Samoa, where there is a thriving tuna fishery, and the call at that port will allow consultation with field station personnel.

A fishery trainee from South Korea, will participate in the expedition as far as Samoa, where he will leave the ship to spend several months in training on Pago Pago-based fishing boats.

Note: See Commercial Fisheries Review, June 1962 p. 8, and August 1962 p. 17.

## Fur Seals

PRICES FOR ALASKA FUR SEAL SKINS AT FALL 1963 AUCTION LOWER:

The fall auction in 1963 (October 17-18) of United States Government-owned fur seal

skins yielded close to $3.1 million. The average price per skin received for male fur seal skins (Black, Kitovi, and Matara) was $111.72. This average price compares with an average of $122.52 paid at the spring 1963 auction, and the $107.53 average for skins sold in the fall 1962 auction. In addition, the average price received for Lakoda or female sheared seal skins was $40.63 as compared with an average of $43.09 received at the spring 1963 auction and an average of $48.40 received at the fall 1962 auction.

Average prices per skin received for processed male fur seal skins at the fall 1963 auction were (average for spring auction in parentheses): Black, $126.13 ($125.87); Kitovi, $95.58 ($116.81); Matara, $103.94 ($121.01).

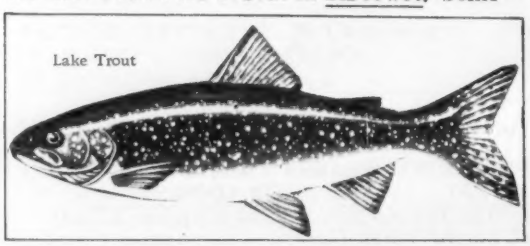
Prices received at the fall 1963 auction for Japanese-owned fur seal skins as compared with the spring 1963 auction were: Black, $124.96 (down 1.4 percent); Kitovi, $99.35 (down 16.9 percent); Matara, $111.03 (down 10.4 percent); and Lakoda $35.26 (up 4.7 percent).

Prices received at the fall 1963 auction for South African skins as compared with the spring 1963 auction were: Black, $31.75 (down 49.7 percent); Deep Blue, $46.96 (down 20.5 percent; and Neutral, $66.25 (down 6.4 percent).

## Great Lakes Fishery Investigations

LAKE TROUT DISTRIBUTION STUDIES CONTINUED:

M/V "Siscowet" Cruise 7 (September 9-18, 1963): To determine the abundance of juvenile lake trout at three index stations in the Apostle Islands region and to collect young-of-the-year lake trout south of Outer Island were the main objectives of this cruise in Lake Superior by the U. S. Bureau of Commercial Fisheries research Siscowet. Semi-balloon bottom trawls were fished at depths of 5-26 fathoms.




The number of lake trout captured per 15-minute trawl tow at the 3 index stations ranged from 1 to 47, and averaged 4.8 east of Madeline Island, 8.0 southeast of Bear Island, and 29.9 east of Basswood Island. The total catch was 448 lake trout, of which 445 (99 percent) were fin-clipped. Lake trout planted at Bayfield in the spring of 1963 predominated in the catches, although ten different trout plantings were represented in the over-all catch.

Seven trawl tows at 5-10 fathoms just south of Outer Island failed to capture young-of-the-year lake trout, although 9 had been taken in the area by the Cisco in 1953, and 3 by the Siscowet in 1959.

Surface water temperatures during the cruise ranged from 55.0° F. south of Outer Island to 63.7° F. east of Madeline Island.

M/V "Siscowet" Cruise 8 (September 23-October 4, 1963): To measure the relative abundance of juvenile lake trout and to study fall environmental conditions at three limnological stations were the main objectives of this cruise in the Apostle Islands region of Lake Superior by the U. S. Bureau of Commercial Fisheries research vessel Siscowet.

Surface water temperatures ranged from 53.1° F. in the open lake to 57.6° F. in protected waters among the islands. A somewhat unusual condition was the clearly defined thermocline which still existed in most areas. In most years, the water is nearly homothermous by the end of September as a result of cooling air temperatures and fall storms.

U. S. Bureau of Commercial Fisheries research Siscowet.

Two experimental gill nets (each of 6 mesh sizes from 2 to 3½ inches) were fished at 12-28 fathoms at Presque Isle Bay, Punky Bay, and just east of Madeline Island. Lake trout were most abundant at depths above 20 fathoms. The total catch from fourteen 2-night sets (45,600 feet of gill nets) was 390 lake trout (range in length 6.6 to 28.0 inches). Of the 332 lake trout less than 17 inches long, 312 (94 percent) were fin-clipped. Most of the fin-clipped fish were from the 1960-61 plants at Bayfield shore.

Other species taken in the gill nets were smelt, chubs, longnose suckers, burbot, and alewives. The catch of 32 alewives (7-9 inches long) was by far the largest made in gill-net sets by the Siscowet since the vessel was assigned to the Ashland Station in 1958.

## Gulf Exploratory Fishery Program

SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 46 (August 21-23, 1963) and Cruise 47 (August 27-October 5, 1963 and October 11-30, 1963): The objectives of these cruises by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers were to: (1) conduct comparative towing tests of standard shrimp trawl doors and a pair of experimental doors of a dihedral or V-design, (2) continue field tests of trawl instrumentation units under development, (3) observe the performance of the prototype electrical shrimp trawl, and (4) make shrimp burrowing observations on various bottom types.

The U. S. Bureau of Commercial Fisheries exploratory fishing vessel, George M. Bowers.

EXPERIMENTAL TRAWL DOORS: In making trawl door comparisons, the 2 assemblies (40-foot flat trawls) were towed simultaneously from outriggers. Measurements were obtained at towing speeds (bottom speed) of 1.5, 2.0, and 2.5 knots and scope ratios of 5:1 and 10:1. Water depth was 5 fathoms and the bottom type was hard sand. The measurements obtained at each speed were horizontal spread, total load (measured on deck), and bottom speed. Since the weight in water of the standard doors was only 20 pounds, tests were also made with the standard doors weighted to equal that of the experimental doors (170 pounds in water).

The results of the tests indicated: (1) the experimental doors towed somewhat easier and spread the trawl more than the standard doors, and (2) the weighted standard doors spread the trawl more than the experimental doors and towed harder. The total load difference, however, decreased markedly with increased speed.

INSTRUMENTATION: The devices tested were the bottom-speed indicator and a closed circuit television system. The indicator functioned very well and is a considerable improvement over the recording method or readout. The television system was tested on a shrimp trawl in clear water. The results were satisfactory, particularly for close-up viewing.

ELECTRICAL SHRIMP TRAWL: A prototype 40-foot electrical shrimp trawl with various electrode array designs was designed and constructed on the basis of data from towing tests with a 20-foot model. While being towed, the prototype was observed by divers to determine the optimum rigging to provide the desired operational and handling characteristics.

SHRIMP BURROWING: Observations and photographs of burrowing behavior of pink shrimp on five bottom types (sand, sand-shell, silt-clay, sand-silt, and grass) were obtained. Also, a diving bell built to the specifications of a unit used by the U. S. Navy Mine Defense

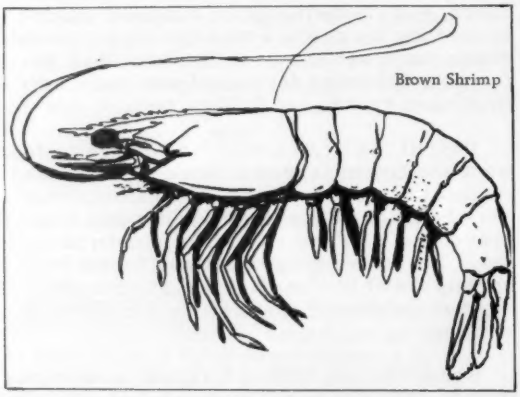
Laboratory was tested. The bell worked very well and shows promise as a means of observation in future behavior studies.
Note: See Commercial Fisheries Review, July 1963 p. 39.

## Gulf Fishery Investigations

Some of the highlights of studies conducted by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries during July-September 1963:

SHRIMP FISHERY PROGRAM: Shrimp Spawning Populations: The examination of ovary samples from slightly more than 7,000 brown shrimp collected systematically during 1962 was almost completed. More than 6,100 of the females could be classified according to the stage of ovary maturity. The criteria for determining ovary condition is being refined, and the independent results of two observers are now in fairly close (80-90 percent) agreement. Ovaries in the process of redeveloping after a previous spawn are the most difficult to classify.

In comparing the seasonal size composition of brown shrimp inhabiting the coastal area between Freeport, Tex., and Cameron, La., observations based on 1962




data proved to be quite similar to those made in 1961. Brown shrimp, almost all subadults--90 to 150 millimeters (3.5 to 5.9 inches) in length--occurred in the 7½-fathom depth zone only during May through November. In the 15-fathom zone, subadults first appeared during June in both years. During 1961, the seaward movement of shrimp into that zone continued through December, but in 1962, brown shrimp less than 150 millimeters (5.9 inches) long were not in evidence after July. Sampling at depths greater than 25 fathoms seldom yielded any but large, mature brown shrimp.

Shrimp Larval Studies: IDENTIFICATION: Several brown shrimp spawned in the laboratory during the third quarter of 1963. On one occasion, the resulting larvae were reared to the second protozoeal stage, which was one stage more advanced than had been obtained in any previous trial. Although the primary effort in this project has been directed toward rearing brown shrimp from larvae to the adult stage, ripe females of four other species were also collected and isolated in the laboratory where they subsequently spawned. Larvae of rock shrimp (Sicyonia dorsalis and S. brevirostris) were reared to the first protozoeal stage. Eggs were also obtained from pink shrimp and Trachypeneus similis, but they did not hatch. Three juvenile rock shrimp (S. brevirostris) reared from a spawn in the spring of 1963 had survived and the largest of those was 25 millimeters (0.98 inches) long in September 1963.

Encouraging progress was made in maintaining mass cultures of penaeid larvae, although contamination of the rearing media by bacteria and other micro-organisms still poses a serious problem. Several antibiotics (penicillin, dihydrostreptomycin, and chloromycetin) and certain commercial preparations are being screened to determine their effectiveness in controlling microorganisms. In preliminary experiments, a penicillin-dihydrostreptomycin combination gave the best results, repressing the bacteria and reducing the activity of ciliates and other motile forms. Addition of the dihydrostreptomycin is associated with a rapid growth of fungus, but it appears that this side effect can be controlled.

In an effort to ascertain the most suitable media for rearing shrimp larvae, actual marine water transported from offshore was compared with water in the recirculating sea water system. Each kind of water was used as a medium: (1) after being autoclaved, (2) with antibiotics added, (3) untreated, and (4) in various combinations of the preceding three. The preliminary experiments indicate that treated water generally gives better results than untreated water. Heavy shrimp larvae mortalities usually occurred in untreated water in the recirculating sea water system, but when sterilized or treated with antibiotics, its quality compared favorably with that of the offshore water.

DISTRIBUTION AND ABUNDANCE: Penaeus larvae and postlarvae, occurring in greater numbers than at any previous period in 1962, were removed and identified from 57 plankton samples collected in November 1962. Concentrations were greatest in the samples collected between Galveston and Brownsville, Tex. (statistical areas 18 to 21). Larval and postlarval stages were 2½ to 5 times more abundant at 25-fathom stations than at the 15-, 35-, 45-, or 60-fathom stations. No planktonic stages of Penaeus species were encountered at 7½-fathom stations. The monthly catch composition by stage consisted of 29 percent nauplii, 21 percent protozoea, 16 percent mysis, and 34 percent postlarvae, all of which indicates continued spawning and a possible build-up of postlarvae in offshore waters.

In addition to vessel operations to carry out regularly scheduled plankton work, three short cruises were made to calibrate flow meters and to investigate the vertical (diurnal) distribution of shrimp larvae and postlarvae. Although data from the vertical distribution study have only been partially analyzed, they suggest that some penaeid planktonic stages exhibit negative phototropism down to depths of at least 18 meters.

Shrimp Postlarval Abundance Survey and Bait (Juvenile) Shrimp Fishery: Semiweekly sampling of postlarval shrimp to determine their abundance as they moved into the Galveston Bay (Tex.) system continued during July-September 1963. Weekly sampling also

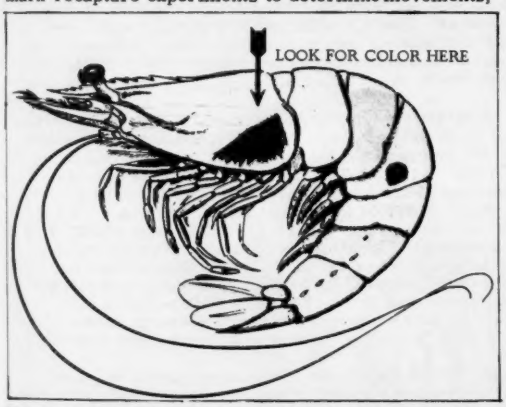
continued at Port Aransas (Tex.), Sabine Pass (Tex.), and Caminada Pass (La.). Sampling at Port Isabel (Tex.), Pascagoula (Miss.), and St. Petersburg Beach (Fla.) was discontinued in mid-August 1963.

Table 1 - Shrimp Catch and Fishing Effort in Galveston Bay Bait Fishery, 1962-1963

| Month | Year | Catch | Catch Composition Shrimp | | Fishing Effort | Average Catch Per Hour |
|---|---|---|---|---|---|---|
| | | | Brown | White | | |
| | | Lbs. | . . (Percent) . . | | Hrs. | Lbs. |
| July | 1963 | 191,000 | 42 | 58 | 6,730 | 28.4 |
| | 1962 | 189,400 | 72 | 28 | 6,320 | 28.5 |
| Aug. | 1963 | 189,200 | 14 | 86 | 4,450 | 42.5 |
| | 1962 | 189,800 | 17 | 83 | 7,920 | 25.2 |
| Sept. | 1963 | 140,300 | 7 | 93 | 4,650 | 30.2 |
| | 1962 | 138,100 | 13 | 87 | 4,830 | 28.6 |

The harvest of bait-size shrimp from Galveston Bay in July-August 1963 showed a slight increase over that in the same period of 1962. The fishing effort expended in July-August 1963 decreased by 27 percent from 1962 estimates, with the catch per unit of effort indicating that shrimp were more abundant on the nursery grounds during the third quarter of 1963 than in the same period of 1962.

Migrations, Growth, and Mortality of Brown and White Shrimp: During the third quarter of 1963, two mark-recapture experiments to determine movements, growth, and mortality in stocks of brown shrimp were carried out. In June 1963, a total of 4,804 stained and 1,208 tagged brown shrimp were released off the Mississippi coast, and by the end of September, 412 stained and 62 tagged specimens had been recovered. In August 1963, a total of 3,016 brown shrimp were stained and released off Aransas Pass, Tex. A total of 52 shrimp were recovered from that experiment. One mark-recapture experiment with white shrimp, also designed to provide information on growth rates, movements, and mortality, was begun during August 1963 in Galveston Bay, Tex. Of the 3;115 stained white shrimp released, 346 were returned. Returns from all three experiments will continue in the latter part of 1963. Tests to determine the rate of nondetection of marked shrimp in different processing plants were carried on in conjunction with each experiment.




Shrimp are marked with blue, green and red biological stains in order to obtain information on migrations and growth. The color appears only on both sides of the head (in the gills) as shown in the illustration.

Commercial Catch Sampling: Several aspects of port sampling operations were modified during the third quarter of 1963 in order to concentrate efforts on particular problems and in areas where the greatest fishing activity occurs. Sampling is now confined to three study areas--the central Texas coast with samplers stationed at Aransas Pass and Freeport, the central Louisiana coast with men at Morgan City and Houma, and the Dry Tortugas area off the southwest coast of Florida with two biologists located at Key West.

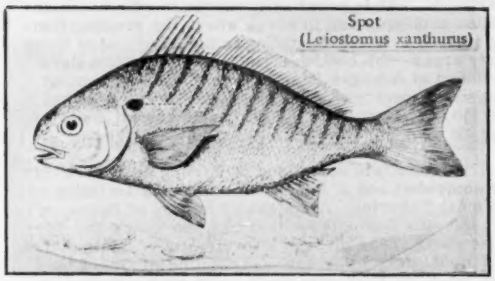
The immediate objectives of work in each area differ somewhat and are dependent on characteristics of the local fisheries. An intensive survey of fishing effort is being conducted within both the Texas and Tortugas study areas through interviews of vessel captains, occasional aerial surveys, and detailed studies of landings made by certain vessels. The size distribution of pink shrimp from the Tortugas grounds and of white and brown shrimp from Louisiana waters are being obtained regularly for use in growth and mortality studies. The species composition of mixed landings and the actual size distribution of box and machine-graded landings are being surveyed at Texas and Louisiana ports. Estimates of the number of small shrimp discarded at sea are also being obtained when possible.

Population Dynamics: Field studies designed to demonstrate the selective action of shrimp nets were initiated and four comparative fishing trials at sea were completed. Various combinations of nets and detachable cod ends with different mesh sizes were used to distinguish escapement from the body of a net and from the cod end. Preliminary results indicated that a significant degree of escapement occurs from both sections of nets with large meshes throughout, but that very few marketable shrimp escape from those nets commonly used in the commercial fishery. In contrast to findings reported for many species of fish, the relationship between mesh size and shrimp escapement is not rectilinear. It is quite likely that the observed divergence results from the manner in which shrimp swim when startled. Several more field trips will be required before final conclusions can be reached.

Florida Bay Ecology Studies: Mark-recapture experiments with pink shrimp in south Florida waters have demonstrated that young shrimp which utilize certain shallow coastal waters as nursery grounds, eventually migrate as subadults to the Tortugas area in the Gulf of Mexico where they later support an important commercial fishery. To determine the magnitude of losses suffered during migration, a new project was designed to relate the seasonal and yearly abundance of juvenile pink shrimp in the nursery areas of eastern Florida Bay to the subsequent abundance of shrimp taken in the Tortugas fishery. The project will also include ecological studies to define conditions affecting the survival and well-being of juvenile pink shrimp while in those nursery areas.

Efforts during the third quarter of 1963 were directed toward: (1) reviewing background information pertaining to pink shrimp ecology in eastern Florida Bay; (2) surveying the Bay for the purpose of establishing sampling stations; and (3) developing methods of quantitatively sampling for the abundance of juvenile shrimp. Two collection methods now under consideration or development are trapping and pumping.

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: Sampling throughout the Galveston Bay system continued under the revised scheme initiated in January 1963. Automated data processing methods were introduced to expedite handling of the large amount of




data being collected. The species receiving greatest attention with regard to population density and life history studies are Atlantic croaker, spot, and sand seatrout, bay anchovy, brown shrimp, white shrimp, and blue crab. Effort is being directed toward relating the distribution and abundance of each species to space-time variation in measurable hydrological factors.

Due to lower than normal rainfall prior to and during the third quarter of 1963, salinities remained relatively high throughout the Bay system as compared with previous years. A well defined salinity gradient persisted, however, between the Gulf of Mexico and Trinity Bay (table 2).

Table 2 - Salinity Values Between the Gulf of Mexico and Trinity Bay, July-September 1963

| Subarea | No. of Stations | Salinity (°/oo) | | |
|---|---|---|---|---|
| | | Average | Minimum | Maximum |
| Gulf of Mexico | 2 | 35.7 | 33.4 | 36.6 |
| Galveston Entrance | 4 | 35.5 | 33.0 | 36.6 |
| Lower Galveston Bay | 14 | 28.2 | 22.4 | 31.4 |
| East Bay | 14 | 21.0 | 16.1 | 24.1 |
| Upper Galveston Bay | 10 | 19.9 | 16.2 | 24.7 |
| Mouth of San Jacinto River | 5 | 17.9 | 14.5 | 22.4 |
| Trinity Bay | 14 | 13.0 | 4.5 | 19.9 |

Early in the summer of 1963, a study of the relationship between bottom types and bottom fauna was begun. Bottom types are being defined according to organic and inorganic constituents, and the percentages of gravel, sand, and fine particles. At each of the previously established biological and hydrological stations, and at five additional stations in Clear Lake, bottom sediments were sampled with a dredge, and bottom fauna were collected with a small oyster dredge lined with $\frac{1}{4}$-inch mesh hardware cloth as well as with a modified beam trawl with $\frac{1}{8}$-inch mesh netting. All bottom fauna were identified and their numbers tabulated.

Accompanied by 80-mile-per-hour winds which produced a $4\frac{1}{2}$-foot tide, Hurricane Cindy passed through the study area on September 17, 1963. Fortunately, weekly sampling was so scheduled that one collection period ended 5 days prior to the hurricane, and the next collection began 5 days following its passage. It is hoped that the resulting data will give some indication of the hurricane's effect on both the fauna and hydrology of the area.

In mid-August 1963, the Texas Water Pollution Control Board initiated a detailed water quality study which covers the entire Galveston Bay system. Of 145 stations established for this study, 32 correspond to those regularly occupied by the U. S. Bureau of Commercial Fisheries during sampling operations. Arrangements were made with the Board for the mutual exchange of hydrological data.

PHYSIOLOGY AND BEHAVIOR PROGRAM: Behavior and Tolerances: During July-September 1963, additional data were obtained on the distribution of grooved shrimp postlarvae in continuous salinity gradients. Six specimens were individually tested at 32° C. (90° F.) and 4 at 17°-19° C. (62°-66° F.). At the higher temperature, the 10°/oo -14°/oo salinity level was the most frequently occupied zone, whereas at 17°-19° C., the 20°/oo -24°/oo level was more frequently visited than any other. Those results support earlier work in which only four shrimp comprised each group. The evidence suggests a marked influence of temperature on salinity selection in these animals.

A series of time-mortality experiments using brown and white shrimp postlarvae was conducted in an effort to: (1) find upper lethal temperature limits, and (2) determine whether such limits differ between species. The lethal limit for postlarvae of both species was found to be about 37° C. (99° F.) at 25°/oo. Aeration was shown to be of vital importance in the experiment. Without aeration, 5 small white shrimp postlarvae survived the temperature of 37° C. for more than $4\frac{1}{2}$ hours, whereas 5 "grooved" (brown shrimp) and slightly larger postlarvae died in $1\frac{1}{2}$-$4\frac{1}{2}$ hours. With aeration, however, no difference between species was apparent. Further work is planned in order to corroborate this finding.

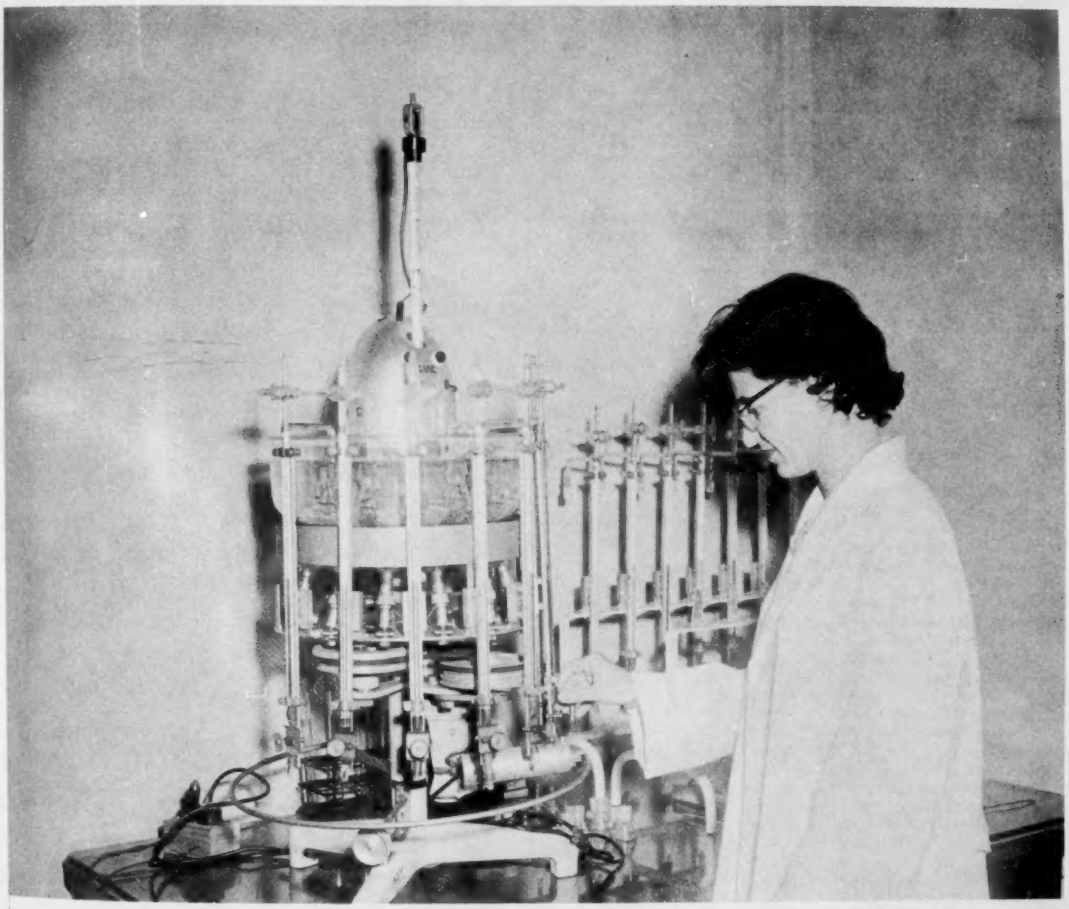
Studies of the effects of electrical shock on growth and long-term survival of shrimp were temporarily suspended because attempts to hold adult brown shrimp in the laboratory's sea water system for extended periods of time have been unsuccessful. On two occasions, 64 specimens were divided into subgroups, in half of which each shrimp was isolated to prevent cannibalism. All experimental shrimp were held in flowing water and regularly fed bits of fresh fish. Of the 128 shrimp brought into the sea water systems, only 33 survived for 4 weeks. After 6 weeks, only 8 remained alive. In both experiments, mortality in the East Lagoon system (92 percent in 4 weeks) was more rapid than that of shrimp kept in the circulating system at Fort Crockett (56 percent). This difference in mortality was greater than that noted between groups in which shrimp were isolated from each other and groups in which individuals were not partitioned. One factor which may have contributed to mortality in the Lagoon system was the occurrence of a dense population of Gonyaulax moni-

lita (a dinoflagellate known to be toxic to fish) in the Lagoon itself and, consequently, in the water supplying the system.

Further study of a flatworm parasite of shrimp in Galveston Bay has brought to light another stage in the worm's life cycle. The new form, which is more mature than the stage occurring in shrimp, is found in the gut of elasmobranchs. This finding directly implicates the elasmobranch as a predator of commercially important shrimp.

Growth of Metabolism: A second growth experiment to test the combined effects of salinity and temperature on postlarval penaeid shrimp was completed. Using postlarval white shrimp as test specimens, trials were run in 5 salt concentrations--2 ‰, 5‰, 11‰, 25‰, and 35‰--at each of 4 levels of temperature--11°, 18°, 25°, and 32° C. (50°, 65°, 77°, and 90° F.). In addition, "grooved" (brown shrimp) postlarvae collected along with white shrimp material and treated as control animals were tested at 25 ‰ salinity and temperatures of 18° and 32° C. As in a previous experiment with grooved postlarvae, differences in growth rate were more closely associated with temperature than with salinity.

In contrast to results of the earlier experiment, no animals survived at 11° C., even though experimental salinity levels were within the range in which grooved postlarvae had been previously maintained for as long as 28 days. Survival at the highest temperature (32° C.) was improved, however, with 75 to 80 percent of the white shrimp surviving in all concentrations but that of



Warburg apparatus used in respiration studies of shrimp tissues.

2 °/₀₀, in which only 35 percent survived. Of the "control" (grooved) postlarvae tested at 32° C., only 34 percent survived 27 days in the 25 °/₀₀ medium. Of the white shrimp postlarvae tested at 18° C., 55 percent survived in the 35 °/₀₀ concentration but only 25 percent in 2 °/₀₀. The results seem to indicate that white shrimp postlarvae can withstand higher temperatures than grooved (brown shrimp) postlarvae and, conversely, that grooved postlarvae are able to tolerate lower temperatures within a broader salinity range than postlarvae of the white shrimp. This speculation was reinforced by the results of studies involving isolated brown and white shrimp postlarvae at the same temperature levels. Brown shrimp postlarvae appeared to grow and survive better at 18° C. than did white postlarvae, with the reverse being the case at 32° C.

CONTRACT RESEARCH: Seasonal Distribution Patterns of Adult and Larval Shrimp in Aransas Pass (Tex.) Inlet: The concrete pond sodded with mud and grass in March 1963 and stocked with representative populations, including shrimp from Red Fish Bay, was seined in July. Although all specimens were removed, no shrimp were taken. They had apparently died or been eaten. Shrimp were not present in similar habitat in Red Fish Bay at the time the pond was seined, but were found in deeper, cooler water nearby. The inability of the pond shrimp to avoid high temperature and low oxygen conditions may have been the main cause for the mortality.

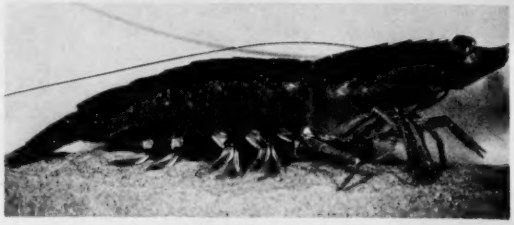
Tide-trap samples were taken several times a week. In general, the biomass (including shrimp) was less during flood tides than during ebb. With the exception of a period in mid-July 1963, most shrimp were taken when the moon was full.

The examination of plankton samples from Aransas Pass was not completed. Catches of planktonic forms of shrimp were greatest at the bottom during the day. During hours of darkness, catches were equally distributed between surface and bottom samples. The largest catch of postlarvae was made during June 1963. After an almost complete absence of penaeid shrimp larvae in July 1963, their numbers increased in early August.

Abundance of Postlarval Shrimp in Mississippi Sound and Adjacent Waters: Regular sampling at 18 stations in Mississippi Sound and adjacent waters was continued. Postlarval white shrimp were present throughout the sampled area with the average catch per station being greatest in July 1963. The numbers of postlarval brown shrimp taken earlier this year indicated a good commercial season and shrimp production approached a record high in June 1963. The numbers of postlarvae taken during the summer of 1963 almost equalled the spring catch. Salinity remained high throughout the area.

Abundance and Distribution of Pink Shrimp Larvae on the Tortugas Shelf of Florida: Plankton samples continued to be collected from Buttonwood Canal at Flamingo Bridge using a 3-inch centrifugal pump. Preliminary analysis of samples taken since October 1962 suggests that pink shrimp postlarvae are alternately planktonic and benthic at the time they enter the canal. This difference in behavior appears to be associated with light intensity and direction of tidal flow. Postlarvae were found to enter Buttonwood Canal throughout the year.

Six cruises to sample plankton over portions of the Tortugas shelf were completed aboard the vessel Miss Fleta. One station was occupied for 24 hours on the July 30-August 1, 1963, cruise. The number of Penaeus larvae taken at that station during midday was nearly double the number taken around midnight. Postlarvae dominated the midnight tows and protozoea were most abundant during the midday tows.



Pink Shrimp.

Juvenile Phase of the Life History of the Pink Shrimp in Everglades National Park Nursery Grounds: A new channel net, designed and built by the U. S. Bureau of Commercial Fisheries, was put into operation on July 30, 1963. The performance of the net was very satisfactory. The wing nets were rehung with webbing identical to that used in the channel net. A preliminary comparison of the catches of the wing nets with those of the channel net show good agreement in size composition and range. The number of shrimp caught in the wing nets varied from 18 to 32 percent of the total sample. It is planned to reduce the amount of sampling with the channel net as long as the relative catch of the wing and channel nets remain comparable.

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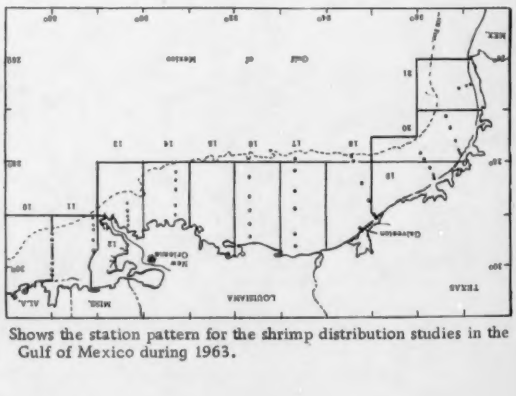
SHRIMP DISTRIBUTION STUDIES: M/V "Gus III" Cruise GUS 9 (September 22-October 5, 1963): Catches of brown shrimp were moderate to good during this cruise off the coast of Louisiana and Texas by the chartered vessel Gus III. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fish-




Shows the station pattern for the shrimp distribution studies in the Gulf of Mexico during 1963.

eries) was engaged in a continuing study of the distribution of shrimp in the Gulf of Mexico.

Eight statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) were covered. One 3-hour tow with a 45-foot shrimp trawl was made in each of 3 depth ranges (0-10, 10-20, and over 20 fathoms) in those areas. Work was hampered on the eastern portion of the cruise by unusually heavy seas.

The best catches of brown shrimp during the cruise were made in 10-20 fathoms off Cameron, La., and Galveston, Tex. Those waters also produced large catches of small white shrimp from under 10 fathoms. Area 17 yielded 89 pounds of 21-25 count brown shrimp from 10-20 fathoms, 38 pounds of 21-25 count brown shrimp from over 20 fathoms, and 64 pounds of over 68 count white shrimp from the depth under 10 fathoms. Area 18 produced a catch of 54 pounds of 15-20 count brown shrimp from the 10-20 fathom range, 36 pounds of 15-20 count brown shrimp from over 20 fathoms, and 47 pounds of 51-67 count white shrimp from under 10 fathoms. In area 19, a tow at the 10-20 fathom depth yielded 158 pounds of 21-25 count brown shrimp.

The other areas yielded fair catches of brown shrimp as follows: 30 pounds (26-30 count) from over 20 fathoms in area 13; 39 pounds (21-25 count) from over 20 fathoms in area 16; 36 pounds (31-40 count) from the 10-20 fathom depth in area 20; and 33 pounds (26-30 count) from 10-20 fathoms in area 21.

The catch of pink shrimp did not exceed two pounds at any station during the cruise.

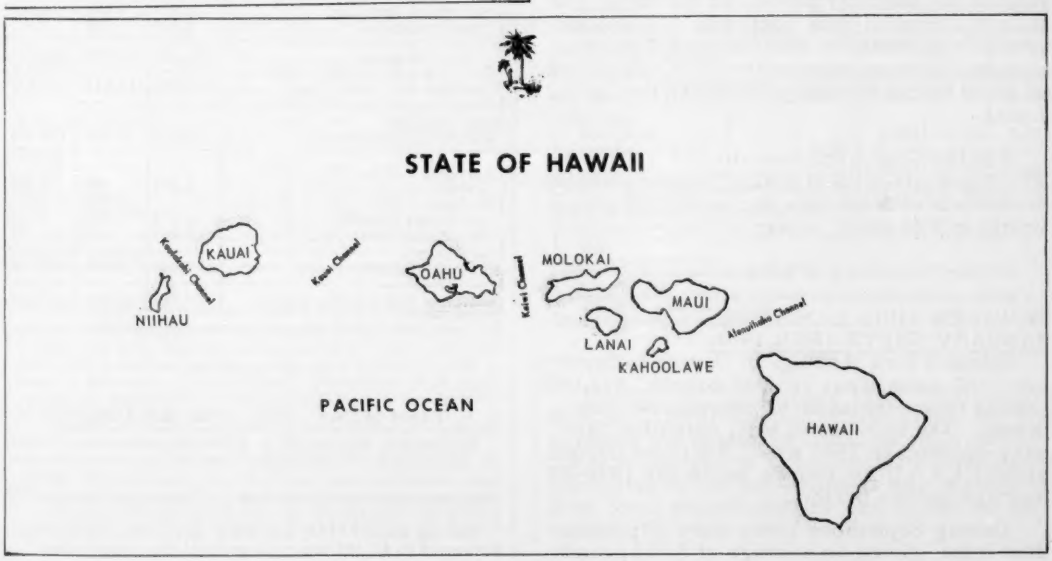
Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, Oct. 1963 p. 23.

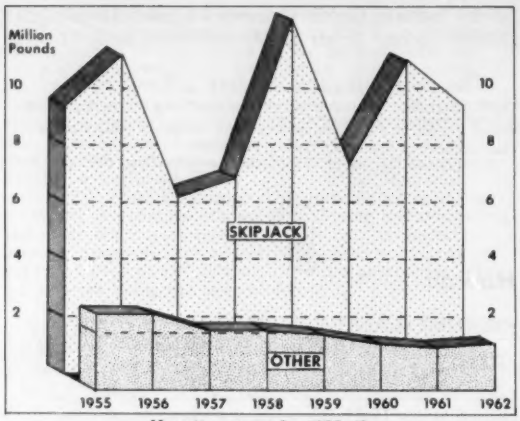
## Hawaii

FISHERY LANDINGS, 1962:

Landings of fish and shellfish in the State of Hawaii during 1962 totaled 13.2 million pounds valued at $2.8 million ex-vessel. Compared with 1961, this was a decrease of 1.3 million pounds or 9 percent in quantity and $76,900 or 3 percent in value.

The decline in quantity in 1962 was due largely to a reduction in skipjack tuna landings which fell 1.5 million pounds below the level of the previous year. The catch of skipjack amounted to 9.4 million pounds--400,000 pounds less than the 1948-62 average of 9.8 million pounds. The decrease fulfilled predictions made early in 1962 of a slightly below average skipjack year. The best yield of skipjack (2.3 million pounds) occurred in June, when there was a great influx of 25-pound fish, which had not been present previously.





Hawaii tuna catch, 1955-62.

After this month of peak production, the quantity dropped sharply.

Other important species which declined included black marlin, down 87,100 pounds and big-eyed scad, down 66,400 pounds. Among the species which showed increased landings were big-eyed tuna and jack mackerel, up 183,000 and 179,600 pounds, respectively. Tuna accounted for 84 percent of the quantity and 68 percent of the value of all fishery products landed in Hawaii.

Oahu led the islands in landings with 10.1 million pounds or 77 percent of the total. The Island of Hawaii was next with 1.6 million pounds, followed by Maui with 1.2 million pounds. The remainder of the catch was landed at ports on the Islands of Molokai, Kauai, and Lanai.

The 1962 catch was taken by 817 fishermen. Fishing craft operated during the year included 60 vessels of 5 net tons and over, 318 motor boats, and 20 other boats.

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## SKIPJACK TUNA LANDINGS, JANUARY-SEPTEMBER 1963:

Skipjack tuna landings in Hawaii in September 1963 were about 580,000 pounds, 373,000 pounds below the 1948-62 average for the month. The cumulative total catch for January-September 1963 was 7.3 million pounds, almost 1.4 million pounds below the 1948-62 average for the period.

During September there were 69 productive trips, giving an average of 5,818 pounds per productive trip. Individual catches ranged from 197 pounds to 20,000 pounds.

# Industrial Fishery Products

## U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-August 1963: Based on domestic production and imports, the United States available supply of fish meal for January-August 1963 amounted to 439,923 short tons--27,049 tons (or 6.6 percent) more than during the same period in 1962. Domestic production was 47,099 tons (or 21.6 percent) less, but imports were 74,148 tons (or 38.0 percent) higher than in the same period in 1962. Peru continued to lead other countries with shipments of 201,764 tons.

The United States supply of fish solubles (including homogenized fish) during January-August 1963 amounted to 77,361 tons--a decrease of 18,182 tons as compared with the same period in 1962. Domestic production and imports dropped 17.6 percent and 44.8 percent, respectively.

U. S. Supply of Fish Meal and Solubles, January-August 1963 with Comparisons

| Item | Jan.-Aug. 1/1963 | Jan.-Aug. 1962 | Total 1962 |
|---|---|---|---|
| | (Short Tons) | | |
| Fish Meal and Scrap: | | | |
| Domestic production: | | | |
| Menhaden | 135,185 | 171,687 | 238,680 |
| Tuna and mackerel | 13,969 | 19,227 | 26,559 |
| Herring | 5,127 | 3,811 | 5,095 |
| Other | 16,498 | 23,153 | 40,898 |
| Total production | 170,779 | 217,878 | 311,232 |
| Imports: | | | |
| Canada | 35,739 | 30,765 | 42,806 |
| Peru | 201,764 | 146,195 | 186,249 |
| Chile | 22,637 | 8,146 | 9,247 |
| So. Africa Republic | 5,975 | 9,184 | 10,084 |
| Other countries | 3,029 | 706 | 3,921 |
| Total imports | 269,144 | 194,996 | 252,307 |
| Available fish meal supply | 439,923 | 412,874 | 563,539 |
| Fish Solubles: | | | |
| Domestic production 2/ | 74,592 | 90,525 | 124,334 |
| Imports: | | | |
| Canada | 1,541 | 795 | 1,335 |
| Iceland | - | 2,205 | 2,332 |
| So. Africa Republic | 191 | 1,091 | 1,717 |
| Other countries | 1,037 | 927 | 924 |
| Total imports | 2,769 | 5,018 | 6,308 |
| Available fish solubles supply | 77,361 | 95,543 | 130,642 |

1/Preliminary.
2/50-percent solids. Includes production of homogenized condensed fish.

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## U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, August 1963: Although production of meal, oil, and solubles during August 1963 was more than for the same month last year, production during January-August 1963 was significantly less than for the same period in 1962.

During August 1963, fish meal and scrap production amounted to 42,486 tons--83 percent from menhaden.

Fish being delivered to the dehydration plant for processing.

Fish solubles and homogenized fish amounted to 18,087 tons, and marine animal oil totaled 34.2 million pounds--88 percent from menhaden. Compared with August 1962, production of fish meal and scrap was up 5 percent, fish solubles and homogenized fish up 8 percent, and marine animal oil up 3 percent.

Table 1 - U. S. Production of Fish Meal, Oil, and Solubles, August 1963 1/with Comparisons

| Product | August | | Jan.-Aug. | | Total |
|---|---|---|---|---|---|
| | 1/1963 | 1962 | 1/1963 | 1962 | 1962 |
| | (Short Tons) | | | | |
| Fish Meal and Scrap: | | | | | |
| Herring | 2,401 | 1,115 | 5,127 | 3,811 | 5,095 |
| Menhaden 2/ | 35,379 | 33,712 | 135,185 | 171,687 | 238,680 |
| Sardine, Pacific | - | 17 | 9 | 665 | 702 |
| Tuna and mackerel | 2,316 | 2,111 | 13,969 | 19,227 | 26,559 |
| Unclassified | 2,388 | 3,485 | 16,489 | 22,488 | 27,297 |
| Total | 42,486 | 40,440 | 170,779 | 217,878 | 298,333 |
| Shellfish, marine-animal meal and scrap | 3/ | 3/ | 3/ | 3/ | 12,899 |
| Grand total meal and scrap | 3/ | 3/ | 3/ | 3/ | 311,232 |
| Fish solubles: | | | | | |
| Menhaden | 15,442 | 12,860 | 55,366 | 61,369 | 84,885 |
| Other | 1,883 | 3,101 | 12,092 | 20,286 | 28,353 |
| Total | 17,325 | 15,961 | 67,458 | 81,655 | 113,238 |
| Homogenized condensed fish | 762 | 850 | 7,134 | 8,870 | 11,096 |
| | (1,000 Pounds) | | | | |
| Oil, body: | | | | | |
| Herring | 2,246 | 1,515 | 4,672 | 4,117 | 5,255 |
| Menhaden 2/ | 30,169 | 30,400 | 120,086 | 162,592 | 237,815 |
| Sardine, Pacific | - | 10 | - | 158 | 167 |
| Tuna and mackerel | 811 | 625 | 2,854 | 3,328 | 5,175 |
| Other (including whale) | 1,010 | 844 | 6,313 | 6,493 | 7,396 |
| Total oil | 34,236 | 33,394 | 133,924 | 176,688 | 255,808 |

1/Preliminary data.
2/Includes a small quantity of thread herring.
3/Not available on a monthly basis.
Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

The quantity of fish meal and scrap processed during the first 8 months of 1963 amounted to 170,779 tons--47,099 tons less than the same period of 1962. Fish solubles and homogenized fish production totaled 74,592 tons--a decrease of 15,933 tons. Production of marine animal oil amounted to 134.0 million pounds--a decrease of 42.8 million pounds.

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Major Indicators for U. S. Supply, September 1963: United States production of fish meal and fish oil in September 1963 was lower by 21.1 and 36.8 percent, respectively, as compared with September 1962. Fish solubles production was down 3.3 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, September 1963

| Item and Period | 1963 | 1962 | 1961 | 1960 | 1959 |
|---|---|---|---|---|---|
| | (Short Tons) | | | | |
| Fish Meal: | | | | | |
| Production 1/: | | | | | |
| November | - | 11,023 | 10,058 | 8,725 | 10,797 |
| October | - | 36,614 | 16,852 | 24,455 | 22,026 |
| September | 24,604 | 31,165 | 28,642 | 36,239 | 36,874 |
| January-August | 170,779 | 217,878 | 228,757 | 196,344 | 190,969 |
| Jan.-Dec. prelim. totals 2/ | - | 288,336 | 289,039 | 257,969 | 275,396 |
| Jan.-Dec. final tot. | - | 311,232 | 311,265 | 290,137 | 306,551 |
| Imports: | | | | | |
| November | - | 11,904 | 25,649 | 6,149 | 3,673 |
| October | - | 12,732 | 9,425 | 12,515 | 3,821 |
| September | - | 13,698 | 13,941 | 9,487 | 9,224 |
| January-August | 269,144 | 194,996 | 145,199 | 87,846 | 111,419 |
| Jan.-Dec. totals | - | 252,307 | 217,845 | 131,561 | 133,955 |
| Fish Solubles: | | | | | |
| Production 3/: | | | | | |
| November | - | 4,147 | 5,153 | 2,891 | 5,451 |
| October | - | 15,510 | 8,418 | 11,139 | 13,946 |
| September | 11,609 | 12,009 | 11,415 | 12,367 | 25,651 |
| January-August | 74,592 | 90,525 | 79,426 | 76,390 | 126,826 |
| Jan.-Dec. prelim. totals | - | 120,886 | 109,018 | 106,361 | 176,913 |
| Jan.-Dec. final tot. | - | 124,334 | 112,241 | 98,929 | 165,359 |
| Imports: | | | | | |
| November | - | 435 | 3,649 | 282 | 3,089 |
| October | - | 290 | 110 | - | 1,908 |
| September | - | 178 | 263 | 38 | 1,732 |
| January-Aug. | 2,769 | 5,018 | 2,245 | 2,794 | 19,481 |
| Jan.-Dec. totals | - | 6,308 | 6,739 | 3,174 | 26,630 |
| | (1,000 Pounds) 5/ | | | | |
| Fish Oils: | | | | | |
| Production: | | | | | |
| November | - | 7,956 | 10,539 | 9,315 | 8,887 |
| October | - | 39,563 | 14,734 | 23,439 | 16,866 |
| September | 19,419 | 30,723 | 24,988 | 30,530 | 22,383 |
| January-August | 133,924 | 176,688 | 196,580 | 132,515 | 124,228 |
| Jan.-Dec. prelim. totals 4/ | - | 257,131 | 259,400 | 206,848 | 189,240 |
| Jan.-Dec. final tot. | - | 255,808 | 266,670 | 215,861 | 193,324 |
| Exports: | | | | | |
| November | - | 171 | 1,425 | 14,640 | 6,096 |
| October | - | 26,003 | 15,202 | 4,434 | 14,331 |
| September | - | 219 | 9,521 | 13,959 | 8,469 |
| January-August | 164,602 | 96,405 | 85,852 | 94,836 | 96,001 |
| Jan.-Dec. totals | - | 123,050 | 122,486 | 143,659 | 144,481 |

1/Does not include crab meal, shrimp, and misc. meals.
2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, 93 percent for 1961 and 1962.
3/Includes homogenized fish.
4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.
5/Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.
Note: Data for 1963 are preliminary.

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Production, September 1963: Preliminary data on U. S. production of fish meal, oil, and solubles for September 1963 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production[1] of Fish Meal, Oil, and Solubles, September 1963 (Preliminary) with Comparisons

| Area | Meal | Oil | Solubles | Homog-enized[3] |
|---|---|---|---|---|
| | Short Tons | 1,000 Pounds | Short Tons | Short Tons |
| September 1963: | | | | |
| East & Gulf Coasts | 21,783 | 18,579 | 9,491 | 82 |
| West Coast[2] | 2,821 | 840 | 2,036 | - |
| Total | 24,604 | 19,419 | 11,527 | 82 |
| Jan.-Sept. 1963 Total | 195,383 | 153,343 | 78,985 | 7,216 |
| Jan.-Sept. 1962 Total | 238,340 | 203,712 | 93,023 | 8,065 |

1/Does not include crab meal, shrimp meal, and liver oils.
2/Includes Hawaii, American Samoa, and Puerto Rico.
3/Includes condensed fish.
Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

## Maine Sardines

CANNED STOCKS INCLUDED IN BUREAU OF THE CENSUS SURVEY:

Notice was given in the Federal Register, October 31, 1963, that the U.S. Bureau of the Census plans to conduct its annual survey of inventories covering 29 canned and bottled products, including vegetables, fruits, juices, and fish as of December 31, 1963. Canned Maine sardines is the only fishery product that will be included in the survey. This survey, together with the previous surveys, provides the only continuing source of information on stocks of the specified canned foods held by wholesalers and in the warehouses of retail multiunit organizations.

Reports will not be required from all firms but will be limited to a scientifically selected sample of wholesalers and retail multiunit organizations handling canned foods, in order to provide year-end inventories of the specified canned food items with measurable reliability. In addition, a number of selected multiunit firms will be requested to provide information on the location of establishments maintaining canned food stocks but not currently reporting in the Canned Food Survey.

## Massachusetts

REGULATIONS PERTAINING TO ICING AND EVISCERATING FISH ON VESSELS AMENDED:

An amendment to Section 14 of the Rules and Regulations promulgated by the Massachusetts Director of the Division of Marine Fisheries, on December 10, 1957, relative to permits and certificates issued by the Division and to the condition and operation of establishments and vessels where fish, shellfish or crustacea are stored, processed or packed, became effective on October 4, 1963. It will remain in force until amended or rescinded by a subsequent order.

The amendment follows:

14. Icing, Eviscerating:

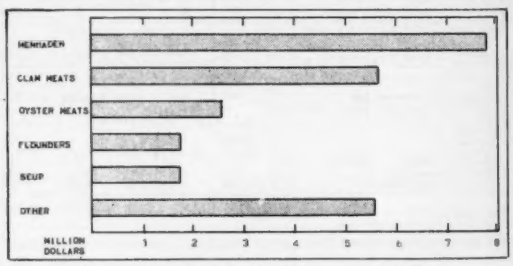
(a) All fish of the following species shall be eviscerated as they are caught and before being packed, iced or stowed aboard the vessels: Haddock, Cod, Pollock, Hake, Cusk and Cat (Wolf) Fish.

(b) The gutting of fish at sea shall be thorough and complete with the removal of all matter from the body cavity. Fish shall be thoroughly washed before being iced. Ice shall be used so that all fish are kept apart in the center of the pens. Ice must be in actual and continuous contact with the fish, it shall effectively separate all fish from bulkheads, sheathing, shelves and pen boards, and must be sufficient in quantity to last for the duration of the storage period.

## Middle Atlantic States

FISHERY LANDINGS, 1962:

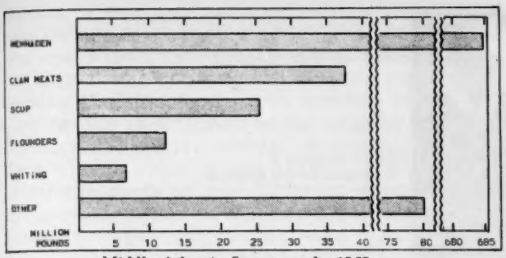
Landings of fish and shellfish in the Middle Atlantic States (New York, New Jersey, and Delaware) during 1962 amounted to 846




Value of Middle Atlantic States catch, 1962.

million pounds valued at $25 million to the fishermen. Landings increased 20.9 million pounds as compared with 1961, due principally to larger catches of fish taken for reduction. The total yield of fish and shellfish was the greatest since 1957. The value was up more than $1 million over the previous year.

Increases were reported in the 1962 landings of clams, 37.4 million pounds (up 3.3



Middle Atlantic States catch, 1962.

million); blue crabs, 3.6 million pounds (up 2.1 million); and sea bass, 3.1 million pounds (up 1.3 million pounds). Fish taken for bait, reduction, and animal food totaled 732.3 million pounds (up 16.7 million pounds). Landings of flounders (12.1 million pounds) and scup (25.6 million pounds) remained about the same as in the previous year.

New Jersey, with 416.6 million pounds, accounted for 49 percent of the catch, followed by Delaware with 29 percent. New Jersey also led in ex-vessel value with $11.8 million or 47 percent of the total; New York was second with 40 percent.

In 1962, there were 8,254 fishermen engaged in the Middle Atlantic fisheries--305 less than in 1961. The decrease occurred in the number of casual fishermen in the shore and boat fisheries, while the number of regular fishermen increased from 1,841 men employed in 1961 to 1,905 in 1962. There were 3,053 fishermen engaged aboard vessels in 1962--32 more than in the previous year. Fishing craft operated in the Middle Atlantic area during the year consisted of 606 vessels totaling 31,622 gross tons, 3,746 motor boats, and 300 other boats.

## Nutrition

AN IMPROVED METHOD OF DETERMINING THIAMINASE ACTIVITY OF WHOLE FISH DEVELOPED:

The antimetabolite (thiaminase) produces a typical thiamine (vitamin $B_1$) deficiency syndrome when certain species of raw fish are fed to fur animals. The resulting deficiency in mink, fox, etc., contributes to the alteration and loss of value of the fur. In addition, the continual feeding of this antimetabolite will result in retarded growth and even eventual death of the animal. The possible economic loss to the fur farming and fishing industries has demanded that work be done to elucidate the properties of thiaminase and the possibilities of altering its activity.

The U. S. Bureau of Commercial Fisheries Technological Laboratory at Ann Arbor, Mich. has completed research on the initial development of a procedure for quantitatively determining thiaminase activity of whole fish utilizing a modification of the thiochrome method for thiamine assay. The procedure has yielded very repeatable results and the data indicates that the method is sufficiently sensitive for use in the study of enzyme kinetics. Studies are in progress to further test the procedure for its effectiveness in determining the thiaminase content of various fish that are currently being used in mink diets. These test are being conducted in cooperation with the U. S. Department of Agriculture Fur Animal Experiment Station at Cornell University, whose staff is obtaining the dietary response of test diets containing thiaminase-fish.

A study of the second phase of the project on thiaminase has been initiated. The work thus far has been restricted to a review of the literature relative to the inactivation of thiaminase by various chemical and physical methods.

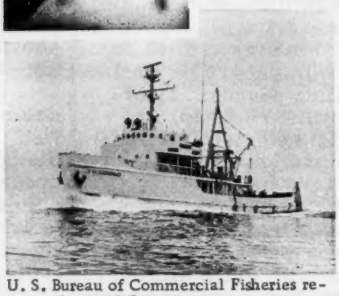
## Oceanography

COMMUNICATIONS SATELLITE ASSISTS OCEANOGRAPHERS:

On September 19, 1963, the Syncom II communications satellite gave an assist to marine observers in verifying oceanographic data collected in the Gulf of Guinea off Africa. It was the first time that a satellite transmitted oceanographic data. Participating in EQUALANT II (the second phase of the International Cooperative Investigations of the Tropical Atlantic), the U. S. Bureau of Commercial Fisheries research vessel Geronimo had been taking Nansen casts between Pointe Noire, Republic of Congo, and Freetown, Sierra Leone. The data, collected to depths of some 1,000 meters, were processed aboard the Geronimo and transmitted to the Kingsport, the Syncom surface station anchored in Lagos Harbor, Nigeria. The Kingsport transmitted the material to Syncom II, some 22,300 miles

NASA's Syncom II communications satellite.

USNS Kingsport, the Syncom's surface station anchored in Lagos Harbor, Nigeria.



U. S. Bureau of Commercial Fisheries research vessel Geronimo.

Star performers in oceanographic communication experiment.

above the Atlantic Ocean, which relayed it to a ground station at Lakehurst, N. J. From there the data were sent along conventional ground lines to the National Oceanographic Data Center (NODC) in Washington, D. C.

At NODC the data were compared with available historical records from the five-degree square within which the readings were made. Deviations were then reported to the Geronimo. Although the exercise was primarily a test of communication speed, a quality control problem did develop in the course of the experiment. The oceanographic station data received from the Geronimo showed unusually large equivalent salinity deviations (up to minus 0.40 $^{o}/_{oo}$) which prompted oceanographers to suspect the validity of the salinity values. It was subsequently learned from the scientists aboard the Geronimo that the platinum resistance thermometer in the salinometer was shorting out and that associated malfunctioning was suspected.

The Syncom II satellite was launched July 26, 1963, from Cape Canaveral, Fla. On August 15, 1963, it reached its on-station position above 55 degrees west longitude through the precise firing of on-board gas jets which "walked" the satellite back from where it was injected into synchronous orbit above the east coast of Africa. Syncom II, at an altitude of about 22,300 miles, appears to trace an elongated figure 8 along 55 degrees west longitude to points 33 degrees north and south of the equator. (Newsletter, September 30, 1963, National Oceanographic Data Center.)

* * * * *

ELECTRONIC DEVICE SPEEDS COLLECTION OF PLANKTON:

Plans to use electronically-controlled buckets to scoop up minute marine organisms from 3,300 feet beneath the sea were reported by University of Rhode Island oceanographers as they left on October 1, 1963, for a 2-week cruise aboard the research vessel Trident to an area about 300 miles southeast of Bermuda. Since the new device permits the gathering of samples five times faster than previous methods, it is hoped that it will lead to the development of more information about zooplankton which is composed of minute animals that float in the sea and form the basic food for many marine species.

To take their samples, the scientists on the Trident planned to lower a metal housing containing five of the special buckets. Each

bucket is equipped with cylindrical cups about two inches in diameter which are enclosed at one end with a fine monel-metal mesh. The buckets in the housing are rotated into a collecting position by a servo motor. The entire device is attached to the ship by double-conductor, coaxial cables. A control box on deck allows opening and closing of the collecting buckets at five different depths and the measurement of the volume of water that flows through each bucket when open. During sampling, the vessel can move at speeds up to six knots.

Previously, scientists had to be content with taking one sample at a chosen depth and then spending sometimes an hour or more retrieving their gear and determining what they had found. In the meantime, the zooplankton at other depths could rise or fall, thus making it difficult to learn how the organisms were stratified. (Newsletter, September 30, 1963, National Oceanographic Data Center.)

* * * * *

DATA QUALITY CONTROL EXPERIMENT:

The National Oceanographic Data Center (NODC) conducted a data quality control experiment in September 1963 with the aid of two vessels participating in the International Cooperative Investigations of the Tropical Atlantic (ICITA). During EQUALANT II, data collected at oceanographic stations by the United States Coast Guard cutter Casco and the Argentine research vessel Comondoro Laserre were transmitted daily to the NODC by radio.

The Coast Guard cutter, Casco, was one of the vessels transmitting daily oceanographic stations by radio to The National Oceanographic Data Center during EQUALANT II.

The data from both vessels were evaluated and compared with averages previously prepared for five-degree squares of latitude and longitude in the area of operations. Evaluation messages in the form of coded histograms were then prepared and sent by radio from NODC to the vessels. Deviations of the observed salinity data from the historical averages were expressed as the mean deviation in equivalent salinity units, and the frequency of deviations of each class were given in percent. The messages provided a background for evaluating the new observations and also served as a basis for intership comparison of data.

The station data from both vessels showed a small constant deviation from the historical data. Had there been a significant difference, the work would have been "suspect." A quality control system of this type becomes more valuable in oceanographic surveys as the number of participating vessels increases.

Ideally, the system could be refined to accept uncorrected data transmitted from ships. The data could be computed and evaluated and suspect techniques or calibrations identified. This would allow research vessels to take appropriate corrective action while still in the area of investigation. (Newsletter, September 30, 1963, National Oceanographic Data Center.)

* * * * *

INFLUENCE OF WEATHER ON OCEAN CURRENTS STUDIED:

To answer questions regarding the interrelation between weather conditions and ocean currents, scientists at the Virginia Institute of Marine Science are carrying out a large-scale research project with help from several Federal agencies. The area under investigation includes 10,000 square miles of open ocean along the Continental Shelf reaching from Cape Henlopen at the mouth of Delaware Bay to Cape Hatteras, North Carolina.

The Virginia scientists are using drift bottles to indicate surface currents, and seabed drifters to discover the direction in which bottom currents flow. The marine laboratory's research vessel Pathfinder traverses the area monthly to record temperatures and salinity every three miles. In addition, airplanes have recorded ocean surface temperatures with an infrared thermometer.

In June 1963, a United States Navy patrol plane flew over the area and released 6 drift bottles and 5 seabed drifters at each of 110 specified stations. Sea surface temperatures

at the release points were recorded from the plane with an infrared thermometer during the flight.

On the sea below, investigators on the Pathfinder gathered temperature and salinity data to determine the internal hydrographic structure of shelf waters, taking readings every 3 miles along 2 transects which cross the area. For 5 days prior to the release date and 10 days following it, the Navy Weather Research Facility provided weather information over the Continental Shelf from Cape Cod to Cape Hatteras.

Research vessel, Pathfinder, traverses area monthly recording temperatures and salinity data every three miles.

It is hoped that the cards in the drift bottles and the forms printed on the seabed drifters when recovered by crews of fishing vessels, sport fishermen, swimmers, and others will be returned to the Virginia Institute of Marine Science, Gloucester Point, Va.

The pattern established in June for the distribution of current bottles and drifters, and the collection of salinity, temperature, and weather data has been repeated each month and will continue regularly until May 1964. At the termination of the project, the assembled information will be analyzed with data-processing equipment. It is hoped that patterns showing the interrelations between winds and sea currents will emerge that will enable scientists to predict ocean current changes from weather observations.

The investigation may solve riddles surrounding the natural transport of fish larvae from ocean spawning grounds to distant upstream nursery areas. It is also hoped that the movements of adult fish will be better understood. Scientists with other interests are also following results of the project.

Other laboratories along the Atlantic Seaboard are conducting similar studies. The Director of the Virginia Institute stated that the work is an excellent example of the type of cooperative program that will be needed to solve the problems of our coastal resources. He pointed out that the area of the Continental Shelf between Cape Hatteras and Cape Cod is one of the most important, but least known areas of the North Atlantic. He said that those waters exercise a profound effect on Chesapeake Bay and other estuarine systems along our coast and it is important that they be understood. (Virginia Institute of Marine Science, October 10, 1963.)

* * * * *

MARINE TECHNOLOGY SOCIETY ESTABLISHED:

The Marine Technology Society, a nonprofit organization, was incorporated in the State of New York in June 1963 as a professional membership society concerned with the exploration and exploitation of the oceans and their potentials, promoting marine science education, and the intelligent interpretation of the discoveries of marine sciences in relation to human betterment. To provide the widest communication and participation, the Board of Directors of the society is composed of officials from industry, Government and the academic community.

The society has initiated programs relating to conservation of marine resources; standardization of oceanographic instruments, techniques, and measurements; the potential of marine sciences to nations with limited technological and economic resources; and the identification of the roles of basic research, applied research, and equipment and systems development in the solution of pressing international needs. Specific projects concern a report on the "state-of-the-art," a report on future requirements of undersea vehicles, a study of the use of obsolete underwater communication cables for oceanographic data retrieval, and the collating of all available technical literature pertaining to marine science.

The society will hold their first national conference in Washington, D. C., on March 24-25, 1964. One of the subjects of the confer-

ence will be buoy technology. (Newsletter, September 30, 1963, National Oceanographic Data Center.)

* * * * *

WORLD OCEANOGRAPHIC DATA DISPLAY SYSTEM:

A new electronic computer is being developed to aid oceanographic research. Known as the World Oceanographic Data Display (WODD) System, it stores digital oceanographic data and is programmed to give a visual display output on an oscilloscope as well as a permanent record on paper tape.

The WODD System could be used to plan and prepare charts and atlases in a fraction of the time it now takes; deviations in data could be quickly identified and information retrieval could be performed in a matter of seconds.

With the new system, it would be possible to analyze data in the following combinations: depth vs. temperature, depth vs. salinity, depth vs. oxygen percentage, density vs. depth, density vs. temperature, density vs. salinity, and density vs. oxygen percentage. (Newsletter, September 30, 1963, National Oceanographic Data Center.)

Note: See Commercial Fisheries Review, September 1963 p. 41.

## Oysters

PATENT GRANTED FOR CHEMICAL COMPOUND TO CONTROL ENEMIES:

A chemical for increasing oyster production by killing off the marine enemies that prey on oysters received U.S. patent 3,103,202.

The compound, known as Polystream, is now being sprayed experimentally on oyster beds in Long Island Sound and tested by the U.S. Fish and Wildlife Service in cooperation with oyster growers in New York and Connecticut.

The chlorinated hydrocarbon pesticide, manufactured by a Niagara Falls, N.Y., firm is not available for general use until test results show it is safe for humans and oysters.

Preliminary tests have proved its effectiveness aganist flatworms, starfish, Crepidula, and drills, which are marine snails that bore holes in the oyster shells and suck out the soft parts of the oyster. The chemical is sprayed on the cultch, a collection of old shells or any other material, to which the oysters attach themselves approximately two weeks after birth.

As the "spat," or young oysters, fasten to the cultch, the marine predators usually attack. However, in one test described in the patent, the number of live oysters found on Polystream-treated cultch was almost three times as great as on the untreated ones. The percentage of "drilled" oysters was eight and one-half times lower on the treated ones, and the "treated" spat oysters were 3 millimeters (about $\frac{1}{8}$-inch) longer than the others.

The patent was issued to scientists of the Milford, Conn., Shellfish Laboratory of the U.S. Bureau of Commercial Fisheries. (Science Newsletter, September 28, 1963.)

## Shrimp

FRESH WATER SHRIMP PLANTED IN CALIFORNIA AND NEVADA LAKES:

The first introduction of fresh-water shrimp into California and Nevada waters was made in September 1963 in Lake Tahoe, the California and Nevada Departments of Fish and Game announced on October 5, 1963.

The first planting of 50,000 fresh-water shrimp was followed 4 days later with a second plant of 50,000, partly in Lake Tahoe and partly in Echo Lake. The shrimp averaged from $\frac{1}{2}$ to $1\frac{1}{4}$-inches in length.

The shrimp planting project is aimed at improving the fishery at Tahoe, and is part of the cooperative Lake Tahoe Fisheries Study being conducted by the two states. The study is partly financed with funds under the Federal Aid to Fish program.

The shrimp (Mysis relicta), were obtained from Upper Waterton Lake in Waterton National Park, Alberta, Canada, through the cooperation of the Canadian National Park Service and the Wildlife Service of the Canadian Department of Northern Affairs and National Resources.

A California Fish and Game plane flew the shrimp to Lake Tahoe.

The two departments hope the shrimp will provide food for lake trout and fill a gap in the food chain to increase the size and number of lake trout. The shrimp is native to the northeastern United States and Canada north to the Arctic Circle, and thrives in deep cold water lakes.

Mysis shrimp, suddenly became established in Kootenay Lake, B. C., 13 years after the original planting, the Departments noted, and has improved the fishery there.

It is hoped that these plants will help insure the establishment of the shrimp by providing a source of supply for further transplants.

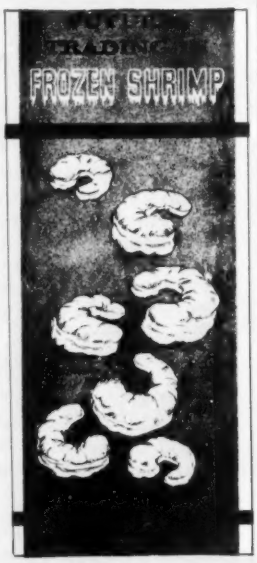
The two Departments expect to plant Mysis shrimp in Tahoe and Echo each year for three successive years.

* * * * *

## FUTURES TRADING FOR FROZEN SHRIMP OPENS IN CHICAGO:

Futures trading in frozen shrimp was conducted for the first time on November 11, 1963, on the Chicago Mercantile Exchange, Chicago, Ill. On that opening day, a total of 65 contract units (325,000 pounds) of frozen shrimp was traded for delivery in January and March 1964.

Rules and specifications governing futures trading in frozen shrimp on the Chicago Mercantile Exchange for delivery in January, March, and September 1964, are as follows:




CLASSIFICATION AND GRADE: All futures contracts for Frozen Shrimp shall be U. S. Grade A raw, frozen, grooved, brown, headless Gulf Shrimp with a count of 15/20 to the pound and shall be restricted to the domestic catch of the Gulf of Mexico waters. All shrimp must meet the requirements of standards as promulgated by the United States Department of the Interior, Fish and Wildlife Service.

TRADING UNIT ON FUTURES CALL: All transactions cleared through the Clearing House shall be in units of 5,000 pounds.

FUTURES PRICE FLUCTUATIONS AND LIMITS: The minimum price fluctuation in the futures market will be 1/10¢ per pound, equivalent of $5.00 per contract. A full cent price change equals $50.00 per contract.

Daily fluctuations are limited to 4¢ (400 points) per pound, upward or downward from the previous day's settling price.

DELIVERIES AND SUBSTITUTIONS ON THE FUTURES CALL. To qualify for delivery Frozen Shrimp shall be tendered for delivery in accordance with requirements of the Exchange rules and with specifications announced by the Board of Governors prior to the opening of the contract. The weight of a delivery unit shall be 5,000 pounds and the grade thereof shall comply with the contract of sale subject to such substitutions as are allowed.

A delivery unit of 5,000 pounds shall consist of 100 master cartons, each master carton containing ten 5-pound packages. The unit shall consist of not more than 3 lots or sublots with no lot or sublot weighing less than 1,000 pounds. The entire unit must be processed by one packer and must be stored during any one calendar month July through January.

Allowable variations in quantity of a delivery unit are as follows: Minimum delivery unit: 4,750 pounds--95 master cartons of 50 pounds each. Maximum delivery unit: 5,250 pounds--105 master cartons of 50 pounds each. A weight tolerance of 3% shall be permitted. Payment shall be made on the basis of the exact quantity delivered.

All shrimp delivered on Exchange contracts shall be of good commercial pack, glazed and packed in paperboard cartons which must meet all Federal regulations governing labeling and packing.

All shrimp shall conform in every respect to the provision of the Federal Food, Drug and Cosmetic Act together with all regulations promulgated thereunder.

Inspection certificates must be in good standing up to 5:00 p.m. on the business day following day of tender.

Par delivery shall be frozen shrimp in approved cold storage warehouses in the Dallas-Fort Worth, Texas, area. Delivery in approved cold storage warehouses at other Texas and Louisiana points shall be on the same basis as if stored in Dallas-Fort Worth with additional allowance from point of storage to Dallas of 18% of the minimum 25,000-pound carlot rail charge.

PERMISSIBLE SUBSTITUTIONS: Frozen shrimp with a count of less than 15 to the pound shall be deliverable at par. Frozen shrimp with a count of 21/25 to the pound shall be deliverable with an allowance of 5¢ a pound. Each delivery unit must be uniform as to count per pound.

INSPECTION CERTIFICATES: Inspections will be made for members only and in the order of applications filed except precedence shall be given to inspections relating to transactions made on Exchange.

An official inspection certificate shall be final. No reinspection upon the same application shall be permitted.

No member shall order an official inspection on another member's goods without the written order of such member.

An official inspection certificate on Frozen Shrimp issued by the Exchange shall state the location and the grade established. It shall bear the signature of the President or Assistant to the President and the seal of the Exchange. It shall state the date of inspection and the time when the certificate expires. This certificate shall be based upon an inspection certificate of the United States Government and such Government certificate (or a copy thereof) shall in all cases accompany the Exchange certificate.

The removal of the commodity from the place or location designated on the inspection certificate invalidates the certificate.

The charge for inspection shall be the cost plus 50¢ per lot for Exchange certificate.

LIFE OF INSPECTION CERTIFICATE. An Exchange certificate based on an inspection made on or after the first business day of July of any year shall remain in force until 5 p.m. on the first business day of the following April provided the shrimp have remained in the same warehouse and have been kept under proper refrigeration in the meantime.

STORAGE CHARGES ON FUTURES CALL TO BE ON A PRO RATA BASIS. On all deliveries made on the futures call the seller must assume storage up to 5 p.m. on the second business day after the date of delivery. The proration shall be on the basis of 1/30th of the prevailing monthly storage rate at the particular warehouse raised to the nearest 5¢ and multiplied by the number of days remaining to the next storage expiration date (all months figured on the basis of 30 days). In no case shall handling charges be included in such proration. The storage charges shall be paid in advance by the person holding shrimp on the storage expiration date and pro rata charges prepaid by such holder shall be added to and shown on the tender notice.

SPECULATIVE POSITION LIMITS: No member for himself or for a customer, and no firm for its own account or for the account of a customer, may carry, control, or have a proprietary interest in more than a total of 200 Frozen Shrimp contracts with a maximum of 200 in any one contract month, nor shall any individual, customer, or firm exceed the above limits in any single day s trading.

Note: See Commercial Fisheries Review, November 1963 p. 45.

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## UNITED STATES SHRIMP SUPPLY INDICATORS, OCTOBER 1963:

| Item and Period | 1963 | 1962 | 1961 | 1960 | 1959 |
|---|---|---|---|---|---|
| | ..... (1,000 Lbs., Heads-Off) ..... | | | | |
| Total landings, So. Atl. and Gulf States: | | | | | |
| December | - | 8,615 | 6,538 | 7,099 | 8,716 |
| November | - | 11,604 | 9,996 | 14,454 | 12,412 |
| October | 20,700 | 14,699 | 12,696 | 21,688 | 19,601 |
| September | 18,195 | 13,182 | 9,691 | 18,832 | 18,330 |
| January-August | 75,029 | 57,739 | 52,474 | 78,961 | 71,600 |
| January-December | - | 105,839 | 91,396 | 141,035 | 130,660 |
| Quantity canned, Gulf States 1/: | | | | | |
| December | - | 1,879 | 816 | 894 | 1,173 |
| November | - | 2,727 | 2,175 | 1,535 | 2,122 |
| October | 3,500 | 4,454 | 2,065 | 2,480 | 2,324 |
| September | 3,640 | 1,727 | 598 | 2,222 | 1,936 |
| January-August | 16,961 | 12,423 | 8,846 | 19,263 | 15,104 |
| January-December | - | 23,210 | 14,500 | 26,394 | 22,659 |
| Frozen inventories (as of end of each mo.) 2/: | | | | | |
| December 31 | - | 31,577 | 19,755 | 40,913 | 37,866 |
| November 30 | - | 27,500 | 20,668 | 37,264 | 37,334 |
| October 31 | 3/ | 21,315 | 17,811 | 31,209 | 33,057 |
| September 30 | 4/27,356 | 12,843 | 13,361 | 24,492 | 26,119 |
| August 31 | 4/24,803 | 12,754 | 12,728 | 20,171 | 23,780 |
| July 31 | 4/25,460 | 13,677 | 14,849 | 17,397 | 22,352 |
| June 30 | 4/24,047 | 13,796 | 19,416 | 15,338 | 19,283 |
| Imports 5/: | | | | | |
| December | - | 15,798 | 15,442 | 12,411 | 10,611 |
| November | - | 17,964 | 14,852 | 13,516 | 10,269 |
| October | - | 18,279 | 16,813 | 14,211 | 15,340 |
| September | 3/ | 9,696 | 8,629 | 8,190 | 7,541 |
| January-August | 90,085 | 79,446 | 70,546 | 65,091 | 62,794 |
| January-December | - | 141,183 | 126,268 | 113,418 | 106,555 |
| | ...(¢/lb., 26-30 Count, Heads-Off)... | | | | |
| Ex-vessel price, all species, So. Atl. & Gulf Ports: | | | | | |
| December | - | 82.9 | 75.2 | 54.2 | 48.4 |
| November | - | 84.5 | 73.5 | 54.0 | 46.2 |
| October | 6/52-62 | 90.0 | 68.7 | 53.0 | 44.4 |
| September | 6/55-61 | 90.9 | 70.1 | 52.2 | 46.4 |
| August | 6/57-71 | 83.6 | 66.1 | 52.0 | 46.9 |
| July | 6/57-78 | 82.1 | 55.8 | 54.6 | 49.2 |
| June | 77.0 | 84.4 | 53.7 | 64.1 | 60.7 |
| May | 80.9 | 83.7 | 52.8 | 62.9 | 63.3 |

(Table continued on next column)

| Item and Period | 1963 | 1962 | 1961 | 1960 | 1959 |
|---|---|---|---|---|---|
| | ..... (1,000 Lbs., Heads-Off) ..... | | | | |
| Wholesale price froz. brown (5-lb. pkg.) Chicago, Ill.: | | | | | |
| December | - | 101-107 | 91-92 | 68-70 | 64-66 |
| November | - | 105-110 | 89-92 | 69-73 | 60-65 |
| October | 67-75 | 108-115 | 83-90 | 69-73 | 59-62 |
| September | 73-77 | 113-118 | 87-90 | 65-70 | 62-64 |
| August | 75-81 | 110-112 | 76-91 | 64-67 | 62-64 |
| July | 80-97 | 3/ | 70-75 | 72-77 | 62-74 |
| June | 95-102 | 102-104 | 67-72 | 76-77 | 73-74 |
| May | 98-103 | 96-103 | 67-69 | 74-77 | 70-76 |

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case).
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Not available.
4/Inventory of June 30, 1963, includes 667,000 pounds; July 31, 1963, includes 925,000 pounds; August 31, 1963, includes 1,011,000 pounds; and September 30, 1963, includes 2,868,000 pounds for firms not reporting previously.
5/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
6/Range in prices at Tampa, Fla.; Morgan City, La., area; Port Isabel and Brownsville, Texas, only.
Note: Data for 1963 are preliminary. October 1963 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

# U.S. Foreign Trade

## IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-September 28, 1963, amounted to 38,082,908 pounds (about 1,813,472 std. cases), according to data compiled by the Bureau of Customs. This was 10.0 percent less than the 42,335,267 pounds (about 2,015,965 std. cases) imported during January 1-September 29, 1962.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1963 at the 12½-percent rate of duty is limited to 63,130,642 pounds (about 3,006,221 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

* * * * *

## AIRBORNE IMPORTS OF FISHERY PRODUCTS, JUNE-JULY 1963:

Airborne fishery imports into the United States in June 1963 amounted to 1,017,500 pounds valued at $509,900, an increase of 11.0 percent in quantity and 10.6 percent in value from those of the previous month. In July 1963, there was a slight decline with imports of 962,100 pounds valued at $484,600. Total airborne imports in January-July 1963 were up 27.3 percent in quantity and 39.2 percent in value from those in the same period of 1962. The increase was due mainly to larger shipments of shrimp and spiny lobsters.

Raw headless shrimp continued to make up the bulk of the airborne shrimp imports--in June 1963, shipments consisted of 847,895 pounds of fresh or frozen raw headless, 46,088 pounds of frozen peeled and deveined, and 7,265 pounds of unclassified shrimp; in July 1963, shipments consisted of 783,151 pounds of fresh or frozen raw headless, 38,411 pounds of frozen peeled and deveined, and 26,461 pounds of unclassified shrimp. Approximately 98 percent of the total airborne shrimp imports in June and July 1963 entered through the U. S. Customs District of Florida. The

U. S. 1/Airborne Imports of Fishery Products, January-July 1963 with Comparative Data

| Product and Origin 2/ | June 1963 | | July 1963 | | Jan.-July 1963 | | Jan.-July 1962 | |
|---|---|---|---|---|---|---|---|---|
| | Qty. 3/ | Value 4/ | Qty. 3/ | Value 4/ | Qty. 3/ | Value 4/ | Qty. 3/ | Value 4/ |
| | 1,000 Lbs. | US$ 1,000 | 1,000 Lbs. | US$ 1,000 | 1,000 Lbs. | US$ 1,000 | 1,000 Lbs. | US$ 1,000 |
| Fish: | | | | | | | | |
| Mexico | 24.4 | 7.3 | 29.1 | 8.0 | 177.9 | 53.9 | 443.6 | 76.9 |
| British Honduras | - | - | - | - | 33.4 | 8.6 | - | - |
| Honduras | 1.0 | 0.3 | - | - | 16.5 | 4.3 | - | - |
| Japan | - | - | - | - | 2.4 | 8.3 | - | - |
| United Kingdom | 0.1 | 0.3 | 0.2 | 0.6 | 1.6 | 4.3 | - | - |
| Iran | - | - | - | - | 1.3 | 7.4 | - | - |
| France | - | - | - | - | 0.7 | 0.6 | 0.3 | 0.7 |
| Rumania | - | - | - | - | - | - | 1.3 | 11.3 |
| Panama | - | - | - | - | - | - | 7.8 | 1.3 |
| U.S.S.R. | - | - | 36.8 | 70.2 | 36.8 | 70.2 | - | - |
| Canada | - | - | - | - | - | - | 31.3 | 16.9 |
| Costa Rica | - | - | - | - | - | - | 5.8 | 0.8 |
| Other countries | - | - | - | - | 0.8 | 0.3 | 0.3 | 0.8 |
| Total Fish | 25.5 | 7.9 | 66.1 | 78.8 | 281.3 | 157.7 | 490.2 | 108.8 |
| Shrimp: | | | | | | | | |
| Guatemala | 20.6 | 10.0 | 3.9 | 1.9 | 141.6 | 74.0 | 137.4 | 70.1 |
| El Salvador | 34.6 | 20.9 | 11.0 | 7.5 | 209.1 | 143.4 | 330.4 | 221.7 |
| Honduras | - | - | - | - | 22.7 | 11.9 | - | - |
| Nicaragua | 51.9 | 18.0 | 71.5 | 30.9 | 380.2 | 172.5 | 662.0 | 300.9 |
| Costa Rica | 26.7 | 13.0 | 64.3 | 26.9 | 375.0 | 179.2 | 166.4 | 82.0 |
| Panama | 150.2 | 84.6 | 171.9 | 67.6 | 1,054.6 | 561.8 | 849.2 | 448.8 |
| Venezuela | 591.0 | 293.5 | 517.2 | 230.1 | 3,028.4 | 1,455.0 | 1,533.6 | 796.5 |
| Ecuador | 17.5 | 6.7 | - | - | 111.6 | 39.4 | 13.2 | 3.4 |
| France | - | - | - | - | 2.6 | 0.9 | - | - |
| Mexico | - | - | 9.2 | 5.1 | 13.2 | 6.9 | 24.8 | 9.1 |
| Netherlands Antilles | - | - | - | - | - | - | 3.1 | 2.7 |
| Total Shrimp | 901.3 | 445.3 | 848.0 | 372.0 | 5,338.0 | 2,595.0 | 3,978.1 | 1,936.2 |
| Shellfish other than shrimp: | | | | | | | | |
| Mexico | - | - | 6.6 | 2.7 | 78.6 | 48.3 | 31.9 | 18.1 |
| British Honduras | - | - | 4.6 | 5.0 | 113.5 | 83.5 | 84.7 | 50.0 |
| El Salvador | - | - | - | - | 5.0 | 3.6 | 0.5 | 0.3 |
| Honduras | - | - | - | - | 1.9 | 1.0 | 60.3 | 47.7 |
| Nicaragua | 8.7 | 5.1 | 30.0 | 7.9 | 101.0 | 67.3 | 0.4 | 0.3 |
| Costa Rica | - | - | - | - | 73.8 | 60.1 | 1.4 | 1.3 |
| Jamaica | 3.3 | 3.3 | - | - | 51.0 | 40.1 | 30.0 | 21.3 |
| Netherlands Antilles | - | - | - | - | 32.8 | 20.9 | 15.9 | 10.0 |
| Colombia | 1.3 | 0.5 | 0.3 | 0.4 | 8.0 | 21.7 | 1.7 | 4.9 |
| Ecuador | - | - | - | - | 2.3 | 1.8 | 1.8 | 1.3 |
| Tunisia | - | - | - | - | 0.8 | 0.9 | - | - |
| Leeward and Windward Islands | - | - | - | - | 1.8 | 0.5 | 20.6 | 7.6 |
| British Guiana | - | - | - | - | 1.7 | 0.3 | - | - |
| Canada | 68.1 | 34.0 | 16.7 | 8.0 | 213.3 | 109.2 | 223.4 | 96.9 |
| Venezuela | - | - | - | - | 13.7 | 6.0 | 22.3 | 13.6 |
| Panama | - | - | - | - | - | - | 1.0 | 1.0 |
| Guatemala | - | - | - | - | - | - | 7.4 | 3.9 |
| Japan | - | - | - | - | - | - | 0.1 | 0.3 |
| France | 1.0 | 1.2 | 0.1 | 0.1 | 1.8 | 2.1 | 0.4 | 1.0 |
| Dominican Republic | 7.3 | 0.7 | 2.9 | 2.0 | 22.0 | 20.7 | 8.6 | 4.8 |
| Peru | - | - | - | - | 0.2 | 0.8 | - | - |
| Yugoslavia | - | - | 1.2 | 0.7 | 1.2 | 0.7 | - | - |
| Trinidad | - | - | - | - | - | - | 2.3 | 1.0 |
| Total Shellfish (except shrimp) | 90.7 | 44.7 | 58.0 | 33.8 | 725.1 | 481.5 | 513.4 | 279.0 |
| Grand Total | 1,017.5 | 509.9 | 962.1 | 484.6 | 6,325.4 | 3,234.2 | 4,970.7 | 2,324.0 |

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. The United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
2/When country of origin is not known, the country of shipment is shown.
3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
4/F.a.s. point of shipment. Does not include U. S. import duties, air freight, or insurance.
5/Less than 50 pounds.
Note: These data are included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, June and July 1963, U. S. Bureau of the Census.

remainder entered through the Customs Districts of New Orleans, (La.) and Los Angeles (Calif.).

Airborne arrivals of live lobsters from Canada amounted to 68,100 pounds in June 1963 and 16,700 pounds in July 1963, all of which entered through the Customs District of Massachusetts. Airborne imports of shellfish other than shrimp in June-July 1963 also included spiny lobster products and crabmeat from Central and South American countries as well as turtles from Yugoslavia and France.

The imports value of airborne finfish products was boosted in July 1963 by the arrival of 26,760 pounds of high-priced caviar from the Soviet Union which entered through the Customs District of New York. From a volume standpoint, fish fillets from Mexico were the leading finfish product imported by air in the first seven months of 1963.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

* * * * *

## UNITED STATES FISHERIES TRADE MISSION TO EUROPE PROPOSED:

It has been proposed by certain segments of the United States commercial fishing industry that the U. S. Bureau of Commercial Fisheries sponsor a fisheries trade mission to certain European countries for the purpose of promoting export sales of United States-produced fishery products in those countries. The mission would be similar to those sponsored by the U. S. Department of Commerce for other industrial groups and is designed to stimulate the United States export trade under the President's Trade Expansion Program.

Recently, strong improvements in European economies plus the advent of modern retail sales facilities have opened up many new sales prospects for United States fishery products abroad. The mission as proposed will be a "Do It Yourself" mission whereby the Government sponsors the project and pays the expenses of the Government representatives who accompany the industry representatives, but the industry participants must defray their entire expenses while serving on the mission. The mission will have official status and will receive the full cooperation of the United States embassies commercial staffs in each of the countries and cities to be visited.

The mission is tentatively scheduled for April or May 1964, and it is estimated that the trip will involve from 4 to 6 weeks travel time. The countries probably to be visited include Belgium, The Netherlands, Luxenbourg, West Germany, France, Italy, United Kingdom, Austria, Switzerland, and Greece. The cities within those countries that will be visited will be determined after an advance trip by a Bureau representative who will arrange reservations, appointments, and other mission details.

The Bureau has sent letters to the various fishery trade associations outlining the purposes and mechanics of the mission with the request that the associations bring this project to the attention of their members.

* * * * *

## WORLD TRADE FAIR SHIP TO EXHIBIT AMERICAN-MADE PRODUCTS:

**A unique opportunity for the United States fishing industry to bring its products to the attention of consumers all over the world will soon be available in the form of a world-traveling Trade Fair ship.**

**The initiator of this country's first efforts to send a Trade Fair ship around the world is Rear Admiral John H. Morrill, U. S. Navy (Retired), who is President of the First United States World Trade Fair Ship, Inc. Admiral Morrill states: "We aim to bring and exhibit American products to the great ports and peoples of the world. More than 40 foreign countries and as many major seaports will be visited."**

**A contract has been signed with a United States shipbuilding firm to convert a 20,000-ton vessel into the S. S. Trade-**

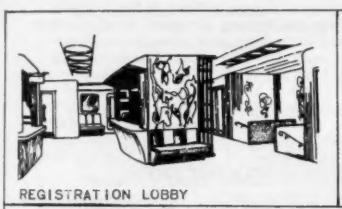
Itinerary of First United States World Trade Fair Ship (Tentative Sailing Date, S/S Tradefair from Port of New York - November 20, 1964)

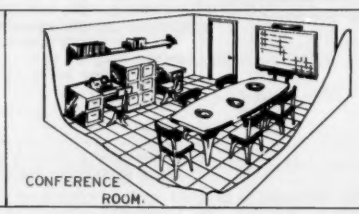
| Port Schedule No. 1 | No. Days in Port | Port Schedule No. 2 | No. Days in Port | Port Schedule No. 3 | No. Days in Port | Port Schedule No. 4 | No. Days in Port |
|---|---|---|---|---|---|---|---|
| Reykjavik (Iceland) | 2 | London | 7 | Jeddah (Saudi Arabia) | 3 | Sydney | 5 |
| Oslo | 3 | Bilbao | 3 | Kuwait | 2 | Melbourne | 4 |
| Helsinki | 4 | Lisbon | 4 | Basrah (Iraq) | 2 | Fremantle (Australia) | 3 |
| Stockholm | 5 | Casablanca | 2 | Abadan (Iran) | 2 | Tamatave (Madagascar) | 2 |
| Copenhagen | 6 | Barcelona | 5 | Karachi | 4 | Durban (South Africa) | 5 |
| Glasgow | 5 | Marseilles | 7 | Bombay | 5 | Cape Town | 5 |
| Liverpool | 5 | Genoa | 7 | Madras (India) | 4 | Buenos Aires | 5 |
| Dublin | 2 | Civitavecchia (Rome) | 5 | Singapore | 6 | Montevideo | 3 |
| Antwerp | 7 | Venice | 6 | Hong Kong | 5 | Santos | 5 |
| Hamburg | 7 | Beirut | 7 | Keelung (Taiwan) | 2 | Rio de Janeiro | 4 |
| Rotterdam | 7 | Istanbul | 3 | Pusan | 4 | La Guaira (Venezuela) | 5 |
| Le Havre | 7 | Piraeus (Athens) | 4 | Osaka | 7 | Cartagena (Colombia) | 3 |
| Total Days . . . | 60 | Total Days . . . | 60 | Yokohama/Tokyo | 8 | Colon (Panama) | 5 |
| | | | | Manila | 6 | Veracruz | 6 |
| | | | | Total Days . . . | 60 | Total Days . . . | 60 |

Note: The Ports of Le Havre, Piraeus and Manila will be exhibit change centers.

fair, at a cost of about $8 to $10 million. The vessel will contain approximately 115,000 square feet of exhibition space with accommodations for several hundred individual exhibitors, business conference rooms, banquet halls, theater and other entertainment facilities. It will be a showcase for prominent products manufactured by United States industries, will be the businessman's "home away from home," and will include facilities for actual sales and business negotiations.

This First United States World Trade Fair Ship is a multi-purpose enterprise designed to promote American industry in world markets and insure better international relations. As a major objective, it will be useful to all business, commerce, and industry everywhere. Its purpose is to provide United States industries with a unique and unprecedented opportunity to sell its products and widen its markets abroad at a critically competitive time.


REGISTRATION LOBBY


CONFERENCE ROOM

MAIN STAIRWAY TO EXHIBIT DECKS

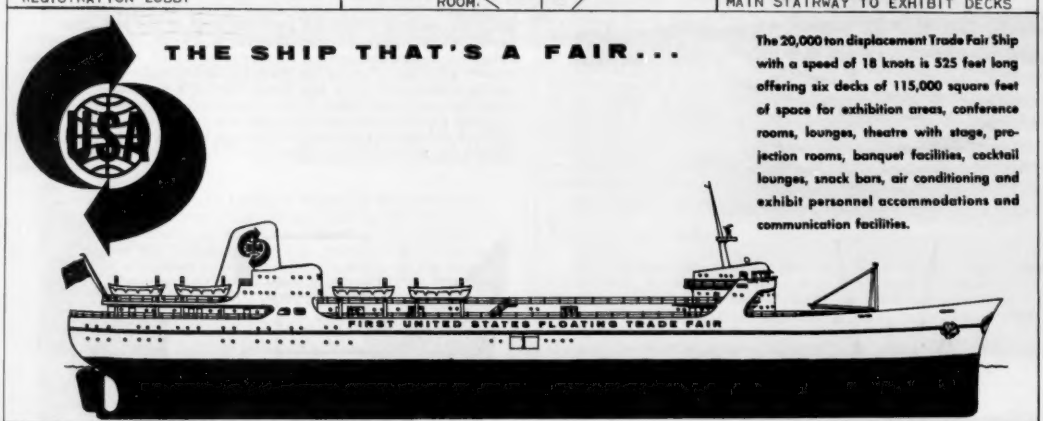
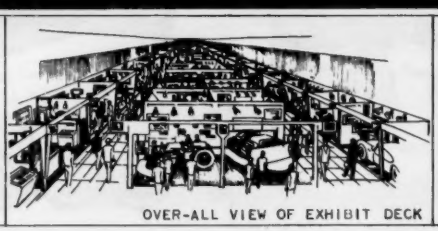

THE SHIP THAT'S A FAIR...
The 20,000 ton displacement Trade Fair Ship with a speed of 18 knots is 525 feet long offering six decks of 115,000 square feet of space for exhibition areas, conference rooms, lounges, theatre with stage, projection rooms, banquet facilities, cocktail lounges, snack bars, air conditioning and exhibit personnel accommodations and communication facilities.
FIRST UNITED STATES FLOATING TRADE FAIR

EXHIBIT CONCOURSE


OVER-ALL VIEW OF EXHIBIT DECK

AN EXHIBIT AISLE

The first voyage of this specially designed vessel is scheduled for November 1964 when it will sail to northern and western European ports. Among the ports to be visited on the first voyage are Liverpool, Glasgow, Copenhagen, Hamburg, Antwerp, and London. The vessel will remain in each of the European ports from 4 to 9 days and will spend a total of 68 days in the 10 ports visited during the first voyage. Following completion of the first voyage, the proposed itinerary of the First United States World Trade Fair Ship calls for 3 subsequent port schedules, each comprising 10 port calls ranging from Bilbao to Beirut, all the way to Karachi, Hong Kong, and Yokohama, and then on to Sidney, Cape Town, Buenos Aires, and Colon. The First United States World Trade Fair Ship is an invitation to all American businessmen to "come aboard and sell American."

## Vessels

### TWO TEXAS SHRIMP FISHING VESSELS FINANCED UNDER MORTGAGE INSURANCE PROGRAM:

The first Brownsville shrimp trawlers financed through the Federal Vessel Mortgage and Loan Insurance Program of the U.S. Bureau of Commercial Fisheries have joined the fleet in Brownsville, Texas. The new vessels, El Indio Loco and Melony Diana will base at that port. The vessels were built by a St. Augustine, Fla., shipyard and were financed by a St. Petersburg, Fla., bank. The bank loans, which provided for 5½ percent simple interest for 8-year maturities, were guaranteed by the U. S. Department of the Interior.

Two modern shrimp trawlers financed through the Federal Government mortgage insurance plan.

Financing the construction of new fishing vessels through the mortgage insurance program has won considerable popularity from commercial fishermen since loans have low interest rates and long maturities. Bankers also, have welcomed such Federal Government assistance since it provides a safe means to extend credit to qualified fishermen.

## Wholesale Prices

### EDIBLE FISH AND SHELLFISH, OCTOBER 1963:

Wholesale price trends for edible fishery products (fresh, frozen, and canned) were somewhat mixed in October 1963 but at 106.8 percent of the 1957-59 average the index was down 0.3 percent from the previous month. Lower prices this October for specific items in each of the subgroups were offset by price increases for other products. The result was a higher subgroup price index for all categories except the drawn, dressed, or whole finfish group which moved in the opposite direction. Compared with the same month a year earlier, the index this October was lower by 10.3 percent. Although prices were up considerably from October 1962 for large fresh haddock and fresh haddock fillets as well as several species of frozen groundfish fillets, sharply lower prices this October for fresh and frozen shrimp, together with lower-priced canned fish products were principally responsible for the index drop from the same month a year earlier.

At New York City, lower October prices for fresh or frozen king salmon (down 3.8 percent) than in the previous month were mainly responsible for a 3.1-percent drop in the subgroup index for drawn, dressed, or whole finfish. October prices also were lower for Great Lakes fresh-water fish at Chicago and New York but these did not significantly influence the subgroup index drop. Prices for halibut increased slightly (up 1.0 percent) because of light supplies of the higher-priced fresh product although frozen halibut stocks were ample at moderate prices.

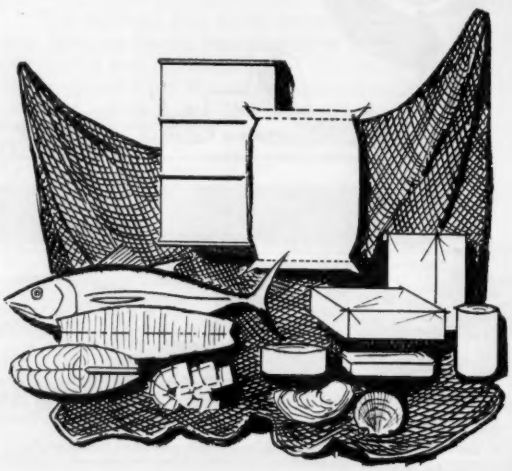


Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, October 1963 with Comparisons

| Group, Subgroup, and Item Specification | Point of Pricing | Unit | Avg. Prices 1/ ($) | | Indexes (1957-59=100) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Oct. 1963 | Sept. 1963 | Oct. 1963 | Sept. 1963 | Aug. 1963 | Oct. 1962 |
| ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) | | | | | 106.8 | 107.1 | 105.5 | 119.0 |
| Fresh & Frozen Fishery Products: | | | | | 110.0 | 110.6 | 108.0 | 124.3 |
| Drawn, Dressed, or Whole Finfish: | | | | | 121.6 | 125.6 | 116.0 | 120.7 |
| Haddock, lge., offshore, drawn, fresh | Boston | lb. | .13 | .13 | 104.0 | 98.5 | 84.6 | 82.2 |
| Halibut, West., 20/80 lbs., drsd., fresh or froz. | New York | lb. | .44 | .44 | 129.9 | 128.6 | 113.8 | 129.6 |
| Salmon, king, lge. & med., drsd., fresh or froz. | New York | lb. | .95 | .99 | 132.7 | 138.0 | 129.2 | 136.2 |
| Whitefish, L. Superior, drawn, fresh | Chicago | lb. | .53 | .68 | 78.3 | 100.7 | 98.5 | 108.2 |
| Yellow pike, L. Michigan & Huron, rnd., fresh | New York | lb. | .51 | .61 | 83.5 | 99.9 | 104.8 | 77.8 |
| Processed, Fresh (Fish & Shellfish): | | | | | 106.6 | 104.3 | 104.5 | 123.8 |
| Fillets, haddock, sml., skins on, 20-lb. tins | Boston | lb. | .47 | .43 | 114.1 | 104.4 | 91.1 | 92.3 |
| Shrimp, lge. (26-30 count), headless, fresh | New York | lb. | .75 | .71 | 87.9 | 83.2 | 82.0 | 122.5 |
| Oysters, shucked, standards | Norfolk | gal. | 7.63 | 7.75 | 128.6 | 130.7 | 134.9 | 130.7 |
| Processed, Frozen (Fish & Shellfish): | | | | | 97.5 | 97.4 | 98.9 | 122.7 |
| Fillets: Flounder, skinless, 1-lb. pkg. | Boston | lb. | .40 | .40 | 100.1 | 100.1 | 98.9 | 100.1 |
| Haddock, sml., skins on, 1-lb. pkg. | Boston | lb. | .39 | .36 | 114.3 | 105.5 | 105.5 | 105.5 |
| Ocean perch, lge., skins on 1-lb. pkg. | Boston | lb. | .34 | .34 | 118.4 | 117.5 | 115.7 | 110.4 |
| Shrimp, lge. (26-30 count), brown, 5-lb. pkg. | Chicago | lb. | .73 | .76 | 86.0 | 90.1 | 93.1 | 134.0 |
| Canned Fishery Products: | | | | | 101.7 | 101.4 | 101.6 | 110.2 |
| Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. | Seattle | cs. | 23.50 | 24.00 | 102.4 | 104.6 | 104.6 | 111.1 |
| Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. | Los Angeles | cs. | 10.88 | 10.88 | 96.6 | 96.6 | 96.6 | 104.4 |
| Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs. | Los Angeles | cs. | 5.75 | 5.75 | 97.5 | 97.5 | 97.5 | 2/ 118.5 |
| Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. | New York | cs. | 8.84 | 7.96 | 113.3 | 102.1 | 104.0 | 116.9 |

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/ One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom. pack, No. 1 oval (15-oz.), 24 cans/cs."--and replaced by--"Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Based on Calif. sardines and not directly comparable with replacement (jack mackerel) for January-October 1963.

The subgroup index this October was 0.7 percent higher when compared with the same month in 1962 principally because of substantially higher prices for ex-vessel large haddock at Boston (up 26.5 percent). Prices this October were higher or lower than a year earlier for other products in the subgroup but these did not measurably influence the subgroup index change.

Higher prices for fresh haddock fillets at Boston (up 9.3 percent) and a 4-cents-per-pound increase in the wholesale price for fresh shrimp at New York City because of light supplies caused the October subgroup index for processed fresh fish and shellfish to climb 2.2 percent from the previous month. Prices for shucked standard oysters at Norfolk were lower (down 1.6 percent) from September to October and were proportionately lower when compared with the same month a year earlier. As compared with the same month in 1962, the subgroup index this October was down 13.9 percent. Lower fresh shrimp prices at New York City (down 28.2 percent) than a year earlier were largely responsible for the drop although this was offset partly by a substantial 23.6-percent increase in prices for fresh haddock fillets.

The slight increase this October in the subgroup index for processed frozen fish and shellfish (up 0.1 percent) was due to higher prices for small haddock fillets (up 8.3 percent) and a fractional increase in prices for ocean perch fillets. The price rise for those products was almost cancelled out by a 4.6-percent drop in frozen shrimp prices at Chicago (wholesale prices down 3 cents a pound). The subgroup this October was 20.5 percent below the same month a year earlier as a direct result of lower frozen shrimp prices this October which were down more than one-third from October 1962.

The October price index for canned fishery products rose 0.3 percent from the previous month because of higher prices for canned Maine sardines. October shipments by canners were reported heavy and this was largely responsible for the market advance. The pack of Maine sardines through October was about 1.6 million cases compared with more than 2 million cases in the 1962 season. Prices for canned tuna were steady and unchanged from September to October but dropped for canned pink salmon (down 2.1 percent). Prices for all canned items in the subgroup this October were below those of a year earlier and the price index was lower by 7.7 percent.

## International

EUROPEAN ECONOMIC COMMUNITY

INVITATION TO ATTEND WEST EUROPEAN FISHERIES CONFERENCE ACCEPTED:

The European Economic Community (EEC) Council of Ministers at a meeting on September 25, 1963, in Brussels accepted the United Kingdom's invitation to a West European Fisheries Conference in London beginning December 3, 1963, according to a report in Vestkysten, a Danish newspaper published in Esbjerg. There was, however, no agreement among EEC members on the agenda. France did not wish to participate in discussions of trade in fish when a fishery policy for the Common Market has not yet been worked out.

From the discussion at the Council meeting it appeared that the understanding of the EEC countries was that at the London conference there would be an ordinary review of the problems without the participants committing themselves either on trade in fish or the extension of fishery limits.

The EEC Commission's vice president, stated that the Commission will submit a first proposal for a common fishery policy in the first quarter of 1964. A spokesman for the Commission added that the common fishery policy should be ready about the latter part of 1964 and that the London conference could be resumed then.

A Danish Ministry of Fisheries spokesman, who probably will be on the Danish delegation, confirmed France's reluctance to be committed to any thing at the Conference. (Regional Fisheries Attache for Europe, U. S. Embassy, Copenhagen, September 27, 1963.)

FOOD AND AGRICULTURE ORGANIZATION

MEETING ON THE USE OF PROTEIN-RICH FOODS IN DEVELOPING COUNTRIES:

The Food and Agriculture Organization (FAO) and the United Nations Children's Fund held a meeting with the food industries and prominent nutritional scientists in Rome from October 21-25, 1963, in order to stimulate the production and use of protein-rich foods in developing areas.

From investigations during the last ten years it became clear that protein deficiency of the diet, particularly of young children, is one of the major nutritional problems in many of the developing regions of the world. This consideration led to intensive work by FAO and other United Nations organizations to aid governments in the development and use of cheap protein-rich foods.

In addition to expanded agricultural production of protein-rich foods of conventional kinds such as meat, fish, milk, and products made from them, intensive efforts are in progress to utilize currently unused sources of proteins for human feeding. Two major sources of such proteins are fish flour and flours obtained from oil seeds, such as groundnuts, sesame, cottonseed, soybean, etc. Progress has already been achieved in producing high-protein foods from such materials for human feeding, but the production is satisfying only a fraction of the need. The major reasons are the difficulties involved in the large-scale production, introduction and marketing of such new foods. The purpose of the meeting was to discuss these problems with representatives

International (Contd.):

of the food industries with the hope that the meeting would enhance progress and lead to the quicker availability of commercially-produced low-cost protein-rich foods.

The plans formulated called for a meeting of about 50 participants from United Nations agencies, interested industries, and scientists. On the agenda were nine basic information papers with the following titles:

(1) Protein malnutrition as a clinical problem.

(2) Availability of edible protein concentrates--present and future.

(3) Nutritional suitability and safety considerations.

(4) Problem of low-cost packaging of foods in tropical areas.

(5) Processing requirements and quality characteristics.

(6) Current situation concerning aflatoxin.

(7) Acceptability testing and marketing problems.

(8) Contacts and cooperation between governments, United Nations agencies, and the food industry. (United States Embassy, Rome, October 3, 1963.)

GULF AND CARIBBEAN FISHERIES INSTITUTE

INTERNATIONAL FISHERIES PROBLEMS DISCUSSED AT MIAMI MEETING:

Among the problems discussed at length during the 16th annual meeting (November 11-15, 1963), of the Gulf and Caribbean Fisheries Institute was the challenge to the United States fishing industry in its home waters by great numbers of foreign fishing vessels. Georges Bank, which is New England's traditional fishing grounds, is virtually covered by a forest of masts. Many are large Soviet stern-trawlers, veritable floating fish-factories with machinery for processing their catch. These modern vessels are said to utilize every part of the fish they catch.

In the Pacific, the Japanese have petitioned the North Pacific Fisheries Commission for a bigger slice of the extensive salmon, halibut, and king crab resources. In the Gulf of Mexico, other foreign vessels, including Soviet trawlers, are reported operating off the Mississippi Delta. United States fishermen claim that their own catches are suffering from the competition on home fishing grounds.

Senator Ernest Gruening of Alaska proposes a 12-mile limit for fishing to protect United States interests. In his opening address at the meeting he explained how legislation he is sponsoring in the present session of Congress would prevent foreign fishing fleets from encroaching on traditional United States grounds.

But if the United States extends her territorial limits for fishing purposes, will other countries retaliate by denying United States fishermen access to areas now being used? Shrimp fishermen, tuna fishermen, and others are alarmed at this possibility as much of their catch is produced off foreign shores. (Prolific shrimp beds are found off the east coast of Mexico while great numbers of tuna are caught commercially off the west coast of South America.) At the meeting, Dr. W. M. Chapman of San Diego, Calif., spokesman for the tuna industry, voiced his industry's fears in regard to the impending legislation.

Other speakers at the meeting described measures being taken by scientists and the government to assist fisheries in the Western Hemisphere. The Federal Government is spending $750,000 annually on studies of commercially-valuable shrimp in the Gulf of Mexico. Similar studies are being conducted on other important fisheries. Achievements made in these fields of research were topics of papers and discussions on November 12 and 14.

Seafood and Public Health was the theme of the sessions on November 13. Reports were made on research done by the U. S. Public Health Service in safeguarding our seafood. Dr. C. P. Li explained work that has led to the discovery of new pharmaceuticals in shellfish. Dr. Albert H. Banner and his research team in Hawaii reported on their success in identifying the agents causing the tropical fish poisoning known as ciguatera.

The Future for Caribbean Fisheries was the subject of reports on November 15. Papers described measures being taken to expand the production of seafood. Dudley Wiles, Fishery Officer of Barbados, described fishing methods which are especially suitable for the small fishing boats in the Caribbean.

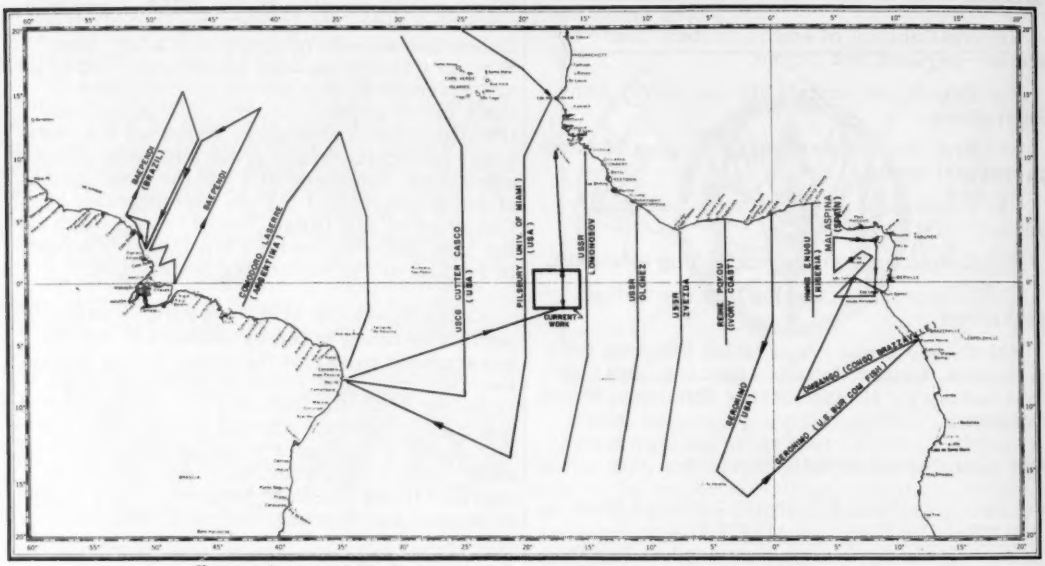
International (Contd.):

The 16th annual meeting was sponsored by the Institute of Marine Science, University of Miami.

INTERNATIONAL COOPERATIVE INVESTIGATION OF THE TROPICAL ATLANTIC

EQUALANT II COMPLETED:

EQUALANT II, the second phase of the International Cooperative Investigations of the Tropical Atlantic (ICITA), was completed in September 1963.




Shows preliminary draft of cruise tracks by research vessels participating in EQUALANT II.

EQUALANT II was planned as a 15-day multiship synoptic research program, to measure selected physical, chemical, biological, meteorological, geological, and geophysical properties of the Tropical Atlantic Ocean. Most of the planned objectives were achieved but because some ships did not reach the survey area on schedule, the program was not entirely synoptic.

* * * * *

PLANS FOR EQUALANT III:

A proposal for an EQUALANT III was discussed during the July 1963 meeting of the International Coordination Group (ICG) for the International Cooperative Investigations of the Tropical Atlantic (ICITA). The proposal, which had been referred to the ICG by the Intergovernmental Oceanographic Commission (IOC), was adopted, and the International Coordinator was requested to develop schedules, plans, and details with the participants, and to coordinate their activities.

The proposal evisioned that (1) each participant, as applicable, would undertake a program rather loosely defined as a "primary mission," which would be coordinated to the degree practicable; and (2) a 15-day program of observations common to all vessels would be included. It was the consensus of opinion that the 15-day multiple-vessel, synoptic program should not duplicate EQUALANT I and II.

It was suggested that direct current measurements should be taken during EQUALANT III using anchored buoys, current meters, and drogues or combinations thereof. It was also suggested that new observation stations to a depth of 1,000 meters would be a valuable supplement to the existing program. The new stations would help to relate physical properties (temperature, salinity, oxygen and, if practicable, inorganic phosphates) to currents. They could also be used to relate geostrophic considerations to direct current measurements. (Newsletter, September 30, 1963, National Oceanographic Data Center.)

Note: See Commercial Fisheries Review, August 1963 p. 78.

International (Contd.):

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

## EXCESSIVE MORTALITY OF SOCKEYE SALMON IN FRASER RIVER SYSTEM UNDER STUDY:

The International Pacific Salmon Fisheries Commission met in an emergency session on October 4, 1963, to consider staff reports on the escapement and spawning of Fraser River sockeye and pink salmon.

At the beginning of the season it was noted that the runs of sockeye were ten days earlier than normal and the escapement was extremely heavy, particularly to the Chilko and Stellako areas. Those runs passed through the Fraser River during a tie-up of the Canadian fishermen. Since earlier than normal escapements usually encounter warm water when arriving on the spawning grounds and because heavy population density seems to be a dangerous factor under such a circumstance, the Commission staff was alert to the possibility of a mortality of unspawned fish. Such a mortality of unspawned sockeye occurred in 1961, especially in the Horsefly River where the run was early, water temperatures were high, and a fairly large population of spawners was present.

Early in September 1963, mortalities of unspawned sockeye started to occur in practically all major spawning areas and a specialist in fish diseases was retained as a consultant to the Commission to work in conjunction with the Commission staff. The specialist is a Research Instructor of microbiology in the School of Medicine at the University of Washington. An examination of sockeye on the Stellako spawning grounds revealed a heavy infestation by columnaris, a bacterial disease that erodes the gill filaments and causes lesions in fish. While some infestation of columnaris was found in the sockeye dying at Chilko, the majority of the fish died without any apparent indication of the disease.

The mortality at Chilko may reach 90 percent of the total escapement which is estimated at about 800,000 sockeye. At Stellako, the mortality rate will be less than at Chilko because of a late arriving segment of the population but the total number of unspawned fish certainly will exceed 100,000. While it is too early to assess accurately the over-all mortality of sockeye in the Upper Fraser Watershed, the number may approach 900,000 fish. Such a loss of spawners is obviously serious to the industry and to the management program of the Commission.

Whatever the reason for the 1963 mortality of sockeye--and it can be extremely complex--there still remains the possibility that any future mortality can be lessened or eliminated either by further control of the escapements from year to year with better cooperation on the part of the fishing industry or in some cases by temperature controls where cold water is available. Columnaris, while being the direct cause of death at Stellako during 1963, and at Horsefly in 1961, is apparently not the basic problem for sockeye died in large numbers at Chilko without any apparent evidence of disease.

The Commission recognizes its responsibilities in reaching a full understanding of the problem as soon as possible even though a control of the situation may be beyond its reach. The mortalities in 1961 at Horsefly and at Chilko and Stellako in 1963, are not only major blows to the future economy of the Fraser River fishery, but are most disturbing to the members of an organization dedicated to bringing the Fraser River sockeye and pink salmon runs into full production. During the coming winter available experts in the appropriate fields of physiology, bacteriology, and genetics will be asked to participate in aiding the Commission in its investigations of this most serious problem.

In regard to pink salmon, the reports by staff observers from the watershed indicate that escapements of both the early and late Fraser runs are favorable although accurate figures will not be available for some time. The late run escapement was expected to continue in smaller numbers to about the middle of October.

Pink Salmon

Good escapements of the early pink run were recorded above Hell's Gate and in the Thompson River and Seton Creek. In the latter area the artificial spawning channel was filling rapidly and as of October was already approaching its estimated capacity of 10,000 fish.

International (Contd.):

Natural water levels in all pink salmon spawning areas are favorable and the fish are in excellent condition. Record high water temperatures prevail because of the unusual warm weather but no mortality of unspawned pink salmon has occurred and there does not appear to be any reason for the time being to anticipate any because of the condition of fish actually spawning.

NORTH PACIFIC FISHERIES CONVENTION

SECOND MEETING IN TOKYO FAILS TO RESOLVE PROBLEMS:

The second meeting of the Parties to the International Convention for the High Seas Fisheries of the North Pacific Ocean which began in Tokyo on September 16, 1963, came to a close on October 7.

The delegations from Canada, Japan, and the United States, giving due consideration to each other's position and problems clarified at the first meeting held at Washington, D.C., in June 1963, continued their deliberations in a very frank and friendly manner with a view to working out a mutually satisfactory solution.

During the course of the meeting the United States delegation submitted a new draft Convention incorporating various modifications to the Japanese draft Convention presented at the Washington meeting. The United States draft Convention offered a new stimulus to discussions at the meeting.

The Japanese delegation proposed modifications to the United States draft, pointing out that the draft amounts in effect to the maintenance of the situation prevailing under the present Convention. The Canadian delegation also submitted some modifications to the United States draft with special reference to certain salmon and herring stocks and the need for cooperation in the broad field of fisheries research.

All three delegations fully discussed and examined these proposals and views, and exerted constructive and conciliatory efforts throughout the meeting to find mutually acceptable means of resolving the problems. The latest meeting thus served a great deal to reduce the differences which existed between the views of the three delegations at the conclusion of the Washington meeting.

However, the three delegations deemed it difficult at the Tokyo meeting to come to complete agreement and concluded that it would be desirable to give further study to means of resolving the remaining differences in the views of the three countries in the light of the work of this later meeting.

The three delegations, being encouraged with the results of this meeting and the hopeful prospects for the future, decided to adjourn and recommend to their respective Governments that a third meeting be convened in the spring of 1964, when further efforts would be made to reach agreement. In this connection the meeting took note of the hope expressed by the Canadian delegation that the next meeting would be held in Ottawa. (Press Release, October 7, 1963.)

NORTH PACIFIC FUR SEAL CONVENTION

PROTOCOL AMENDING INTERIM CONVENTION SIGNED:

A Protocol amending the 1957 Interim Convention on Conservation of North Pacific Fur Seals was signed on October 8, 1963, in Washington, D. C., by representatives of the four Governments that are Parties to the Convention. Signing for the Government of the United States of America was the Deputy Under Secretary of State for Political Affairs. Signing for the Governments of Canada, Japan, and the Union of Soviet Socialist Republics were their Ambassadors in Washington. The Interim Convention has been in force since October 14, 1957. The provisions of the Protocol reflect the recommendations adopted by the North Pacific Fur Seal Commission on November 30, 1962.

The significant feature of the Protocol is the continuation of the Interim Convention for another 6-year period. The North Pacific Fur Seal Commission will continue its scientific investigations toward achieving the maximum sustainable productivity of the fur seal resources of the North Pacific Ocean to the end that the fur seal populations can be brought to and maintained at levels which will provide the greatest harvest year after year, with due regard to their relation to productivity of other living marine resources of the North Pacific. The protocol will later be submitted to the U. S. Senate for advice and consent to ratification, and will enter into force, following ratification by other Party Governments.

International (Contd.):

WORLD FISHERY CATCH

FISHERY LANDINGS, 1962:

World fishery production in 1962 increased by 8 percent over that in 1961, reaching an all-time high of 44,500,000 metric tons (live-weight basis), according to a preliminary estimate prepared by the Food and Agriculture Organization (FAO) of the United Nations.

Peru had the most spectacular increase in 1962 and was within a few thousand tons of overtaking Japan as the world's largest fish-producing nation. Mainland China remained the third largest fishing nation of the world, although the computation of its catch (5 million tons) was based on estimates made by FAO. The Soviet Union exceeded its 1962 production goal of 3,900,000 tons and actually produced 4,100,000 tons, a gain of 26 percent over 1961. The United States remained in fifth place with a catch of 2,904,900 tons. Other countries with 1962 fishery landings in excess of 1 million tons were Norway with 1,338,000 tons, South Africa with 1,062,300 tons, and Spain with 1,023,800 tons.

Countries reporting a substantial percentage increase in fishery landings in 1962 included Denmark (up 22.5 percent from 1961),

Total Catch (Live Weight) of Fish and Shellfish in Selected Countries, 1959-1962 and 1955-1959 Average

| | 1/1962 | 1961 | 1960 | 1959 | Average 1955-59 |
|---|---|---|---|---|---|
| | (1,000 Metric Tons) | | | | |
| World total catch | 44,500.0 | 41,160.0 | 38,020.0 | 35,740.0 | 31,426.0 |
| 1959 catch--1,000,000 tons and more: | | | | | 17,791.5 |
| Japan | 6,863.7 | 6,710.5 | 6,192.7 | 5,884.1 | 5,294.3 |
| China (Mainland) | 2/ | - | - | 5,020.0 | 3,473.2 |
| United States | 2,904.9 | 2,931.9 | 2,814.7 | 2,890.8 | 2,827.8 |
| U. S. S. R. | 4,100.0 | 3,250.0 | 3,051.0 | 2,756.0 | 2,603.8 |
| Peru | 6,830.0 | 5,243.1 | 3,531.4 | 2,152.4 | 815.3 |
| Norway | 1,338.0 | 1,509.4 | 1,540.7 | 1,575.2 | 1,751.2 |
| Canada | 2/ | 1,020.8 | 934.5 | 1,054.4 | 1,025.9 |
| 1959 catch--500,000 tons and more but less than 1,000,000: | | | | | 6,634.1 |
| United Kingdom | 944.4 | 902.7 | 923.8 | 988.9 | 1,030.7 |
| Spain (incl. Ceuta and Melilla) | 1,023.8 | 1,014.5 | 898.0 | 855.8 | 802.0 |
| India | 2/ | 961.0 | 1,161.4 | 823.2 | 994.3 |
| Germany, Fed. Rep. | 632.7 | 618.9 | 674.0 | 768.0 | 783.6 |
| Denmark and Faroe Islands | 928.4 | 757.5 | 690.6 | 760.9 | 643.0 |
| South Africa (incl. South West Africa) | 1,062.3 | 1,010.3 | 867.6 | 741.6 | 624.8 |
| Indonesia | 943.0 | 906.8 | 756.7 | 754.1 | 699.2 |
| Iceland | 832.6 | 710.0 | 592.8 | 640.8 | 544.3 |
| France | 672.3 | 567.7 | 570.7 | 555.8 | 512.2 |
| 1959 catch--100,000 tons and more but less than 500,000: | | | | | 5,276.7 |
| Philippines | 504.7 | 475.7 | 465.5 | 457.5 | 422.7 |
| Portugal | 2/ | 570.2 | 475.1 | 427.8 | 450.1 |
| Korea, Rep. of | 450.4 | 424.5 | 357.2 | 392.1 | 363.4 |
| Burma | 2/ | 360.0 | 360.0 | 360.0 | 360.0 |
| Netherlands | 321.9 | 346.0 | 314.7 | 319.6 | 310.4 |
| Korea, North | 2/ | 2/ | 2/ | 2/ | 300.7 |
| Pakistan | 330.6 | 319.1 | 304.5 | 290.1 | 280.9 |
| Chile | 638.6 | 429.8 | 339.6 | 272.6 | 222.9 |
| Sweden | 290.9 | 267.3 | 254.3 | 268.0 | 229.0 |
| Angola | 2/ | 241.5 | 252.0 | 267.4 | 330.4 |
| Taiwan | 327.0 | 312.4 | 259.1 | 246.3 | 211.5 |
| Brazil | 2/ | 2/ | 257.1 | 244.3 | 216.5 |
| Italy | 218.6 | 239.6 | 213.3 | 214.9 | 214.1 |
| Thailand | 2/ | 305.6 | 220.9 | 204.7 | 213.3 |
| Mexico | 2/ | 2/ | 2/ | 190.6 | 144.5 |
| Poland | 179.6 | 185.5 | 183.9 | 162.2 | 142.5 |
| Viet-Nam, Rep. of | 255.0 | 250.0 | 240.0 | 153.5 | 136.6 |
| Congo (Leopoldville) | 2/ | 2/ | 2/ | 153.4 | 118.9 |
| Cambodia | 145.8 | 2/ | 2/ | 2/ | 150.0 |
| Federation of Malaya | 198.4 | 178.4 | 167.1 | 145.9 | 139.8 |
| Morocco | 2/ | 164.9 | 154.1 | 144.4 | 130.7 |
| Germany, East | 2/ | 2/ | 114.4 | 105.6 | 87.8 |

1/Preliminary.
2/Data not available; estimates used in computing world total catch.
Note: Countries arranged in order of 1959 catch.
Source: Food and Agriculture Organization of the United Nations.

International (Contd.):

Iceland (up 17.2 percent), Chile (up 48.6 percent), and France (up 18.4 percent).

Note: See Commercial Fisheries Review, January 1963 p. 75.

## Argentina

FISH MEAL AND OIL PRODUCTION AND EXPORTS, 1961-1962:

Fish meal production in Argentina reached 4,520 metric tons in 1962 and is expected to jump to 20,000 tons in 1963. The expanding industry is centered in Mar del Plata where four reduction plants are located.

Argentina's Production and Exports of Fish Meal and Oil, 1961-1962

| Item | 1962 | 1961 |
|---|---|---|
| | .... (Metric Tons) .... | |
| Fish Meal: | | |
| Production | 1/4,520 | 2/2,700 |
| Exports | 1,584 | 260 |
| Fish Oil: | | |
| Production: | | |
| Fish body oil | 718 | 900 |
| Shark liver oil | 1 | 5 |
| Exports | 383 | 508 |

1/Includes 1,273 tons produced from fresh-water fish.
2/Includes 900 tons produced from fresh-water fish.

Fish meal exports also increased in 1962. Italy was the leading buyer of Argentine fish meal in 1962 with 48 percent of the total exports, followed by West Germany with 19 percent, Belgium with 18 percent, Spain with 9 percent, and Brazil with 6 percent. (United States Embassy, Buenos Aires, September 14 and October 4, 1963.)

## Australia

CANNED TUNA IMPORT DUTIES INCREASED:

The Australian duty rates on canned tuna imports were increased on August 16, 1963, from 56 to 100 percent. The new rates of duty are as follows: British preferential rate, 1 shilling and 2 pence or about 13.08 U. S. cents a pound; most favored nation rate, 1 shilling 4 pence or about 14.90 U. S. cents a pound; and general rate, 1 shilling 7 pence or about 17.75 U. S. cents a pound. Prior to August 16, 1963, the rates were: British preferential rate, 7 pence or about 6.54 U. S. cents a pound; most favored nation rate, 9 pence or about 8.41 U. S. cents a pound; and the general rate, 1 shilling or about 11.21 U. S. cents a pound. Canned tuna is classified as Tariff Item 51 (c)(5).

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DUTIES ON CANNED FISH INCREASED TEMPORARILY:

In a report dated October 16, 1963, the Australian Special Advisory Authority recommended that a temporary additional duty of five Australian pence (about 4.75 U. S. cents) be levied on most canned fish items under Tariff Item 51 (C)(4). Regular rates are: British preferential rate, 1 pence (about 0.95 U. S. cents); and the most favored nation rate, 3 pence (about 2.85 U. S. cents). The temporary duty will apply to goods in direct transit to Australia on September 30, 1963.

Pilchard cutlets or fillets are not exempt from the increased duties, but canned (essentially) whole pilchards are exempt. (United States Embassy, Canberra, October 24, 1963.)

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EXPORTS AND LANDINGS OF SPINY LOBSTERS, FISCAL YEAR 1962/63:

Exports: Australia's total exports of spiny lobster products in fiscal year 1962/63 (July 1962-June 1963) were down 0.5 percent in quantity and 9.0 percent in value from those in the previous fiscal year. Lower exports of lobster tails in fiscal year 1962/63 were almost offset by a gain in shipments of whole lobsters. But declining prices for lobster tails in the dominant United States market resulted in a lower over-all value for the 1962/63 exports.

Table 1 - Australian Exports of Spiny Lobster Products, Fiscal Year 1961/62 and 1962/63

| Product and Country of Destination | 1/1962/63 | | | 2/1961/62 | | |
|---|---|---|---|---|---|---|
| | Quantity | Value | | Quantity | Value | |
| | 1,000 Lbs. | A£ 1,000 | US$ 1,000 | 1,000 Lbs. | A£ 1,000 | US$ 1,000 |
| Spiny Lobster Tails: | | | | | | |
| United States | 8,691 | 5,017 | 11,173 | 9,765 | 5,956 | 13,264 |
| France | 122 | 61 | 136 | 1 | 3/ | 3/ |
| Canada | 57 | 33 | 73 | 45 | 28 | 62 |
| Other countries | 78 | 48 | 107 | 61 | 37 | 82 |
| Total | 8,948 | 5,159 | 11,489 | 9,872 | 6,021 | 13,408 |
| Spiny Lobsters, Whole: | | | | | | |
| United States | 501 | 174 | 387 | 89 | 31 | 69 |
| France | 745 | 260 | 579 | 346 | 117 | 260 |
| Other countries | 137 | 45 | 100 | 78 | 25 | 56 |
| Total | 1,383 | 479 | 1,066 | 513 | 173 | 385 |
| Total exports of spiny lobster products | 10,331 | 5,638 | 12,555 | 10,385 | 6,194 | 13,793 |

1/Preliminary.
2/Revised.
3/Less than A£1,000.

Australia (Contd.):

Landings: Australian landings of spiny lobsters in fiscal year 1962/63 were up 5.7 percent from the previous year due mainly to greater production in Western Australia and South Australia. The Director of Fisheries in Western Australia reported that heavier landings resulted from an increase in fishing effort, and that the catch per fishing unit would be below the average of the previous year. (Fisheries Newsletter, October 1963.)

Table 2 - Australian Landings of Spiny Lobsters, by States, Fiscal Years 1956/57-1962/63

| Year | New South Wales | Victoria1/ | Queensland | South Australia | Western Australia | Tasmania1/ | Total Landings |
|---|---|---|---|---|---|---|---|
| | | | | (1,000 Pounds2/) | | | |
| 1962/63 | 466 | 970 | 7 | 4,700 | 20,500 | 3,800 | 30,443 |
| 1961/62 | 384 | 1,138 | 58 | 4,025 | 19,238 | 3,964 | 28,807 |
| 1960/61 | 467 | 1,266 | 41 | 3,721 | 18,019 | 3,971 | 27,485 |
| 1959/60 | 492 | 830 | 40 | 3,500 | 19,545 | 3,601 | 28,008 |
| 1958/59 | 461 | 823 | 25 | 4,250 | 17,517 | 3,226 | 26,302 |
| 1957/58 | 525 | 636 | 23 | 4,460 | 13,327 | 2,993 | 21,964 |
| 1956/57 | 473 | 689 | 9 | 4,385 | 10,763 | 2,579 | 18,898 |

1/Catch by Victorian fishermen in Tasmanian waters has been included in Tasmania landings.
2/Live-weight basis.

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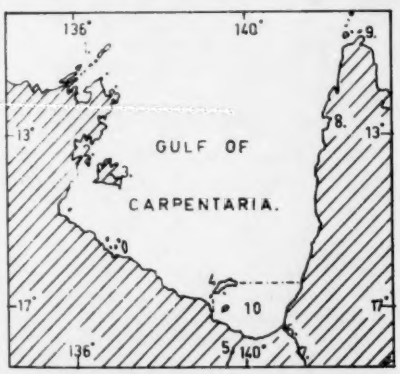
GULF OF CARPENTARIA SURVEYED FOR SHRIMP RESOURCES:

Three Australian expeditions are surveying the Gulf of Carpentaria for possible shrimp resources.

The joint Queensland Commonwealth survey in the southeastern portion of the Gulf is being carried out with the 48-foot vessel Rama, chartered from a commercial fishing company. The initial charter runs to December 31, 1963, after which a decision will be made whether to extend it or change to a different type of vessel. The survey may continue for two years. A meeting of the Queensland Commonwealth survey committee was to be held September 28, 1963, to appraise the results of the survey.




1. Wessel I. 2. Blue Mud Bay. 3. Groote Eylandt. 4. Mornington I. 5. Burketown on Albert R. 6. Karumba and 7. Normanton, both on Norman R. 8. Weipa. 9. Cape York. 10. Dash-dot line marks outer boundary of present survey area.

A private firm has installed and equipped a fishing base at Karumba, including the provision of fresh water, food, and supplies, ice-making plant, and ice storage, also an electric plant for power and light. Power ashore is produced by three Diesel-driven alternators with a combined capacity of over 300 hp.

The electricity and ice plants were carried to the Gulf from Sydney by semitrailers while wharfage poles went overland from North Queensland. All other equipment and stores were carried from Fremantle in the company's 300-ton freezer vessel Laakanuki. This vessel, which the company has been using as a mothership for processing lobster tails in Western Australia, is being similarly employed in the Gulf shrimp enterprise. She is equipped with two blast freezers, brine freezer, and 100 tons of refrigerated storage, and is powered by two 200 hp. Diesels, plus auxiliaries for compressors, etc.

The company had 7 shrimp trawlers working by arrangement in the Gulf area at the end of July, but two left the area in August owing to unavoidable delay in installing and equipping the Karumba base and inability to locate shrimp in the area.

A spokesman said that any fishermen who might go all the way to the Gulf in hope of success in this experimental stage, without having made sure of all the necessary supplies and facilities, would inevitably be disappointed.

"Firstly," he said, "shrimp must be located and caught, and to date we have found them just as elusive as they have proved to be elsewhere. The next problem to be faced is that of processing facilities, and before operating at all, fishermen would need

Australia (Contd.):

to have assured themselves, in that remote and isolated area, of continuing supplies of such essential needs as fresh water, fuel, and ice."

It was also pointed out that, owing to the isolation of the area, it is necessary to have essential plant available in duplicate, and to have adequate stocks of all spare parts likely to be required for plant, vessel equipment, and fishing gear, lack of which might bring fishing to a stop perhaps just when shrimp had been located.

In the initial stages, the Karumba based company in their fishing operations are following the pattern laid down by the Rama survey. In these stages the company plans to road freight catches in refrigerated trucks to the Queensland east coast for processing, but it could process shrimp on the spot, ready for export, if warranted and provided that the necessary labor could be obtained.

Another Australian firm is operating 6 chartered shrimp trawlers. This company is working these vessels westerly from Mornington Island outside the official survey area so that an extended area of the Gulf will be explored. Five of the vessels are freezer vessels and the sixth has brine tanks. This firm is thus independent of shore freezing and will freight Gulf catches in refrigerated trucks some 1,600 miles to its Tweed Heads processing works.

The 6 vessels were steaming some 2,500 miles from Fremantle to the Gulf, via Darwin, and in mid-September, en route were testing shrimp resources in Buckingham Bay and Arnhem Bay, just outside the northwest corner of the Gulf. (Fisheries Newsletter, October 1963.)

* * * * *

SHRIMP EXPORTS UP SHARPLY IN FISCAL YEAR 1962/63:

Preliminary figures released by the Australian Commonwealth Statistician show a sharp increase in exports of both cooked and raw shrimp in 1962/63 over 1961/62 (fiscal years July-June). Exports of cooked shrimp rose from 71,026 pounds in 1961/62 to 247,342 pounds in 1962/63, an increase of 248 percent; raw shrimp exports reached 977,202 pounds in 1962/63, an increase of 1,853 percent over the 1961/62 exports of 50,027 pounds. A significant feature is the development of markets for cooked shrimp in France and for raw shrimp in Japan and the United States. (Australian Fisheries Newsletter, October 1963.)

Table 1 - Australian Exports of Cooked Shrimp

| Destination | 1962/63 1/ | | | 1961/62 | | |
|---|---|---|---|---|---|---|
| | Qty. | Value | | Qty. | Value | |
| | Lbs. | A£ | US$ | Lbs. | A£ | US$ |
| France | 143,977 | 35,606 | 79,793 | 10,464 | 2,927 | 6,559 |
| New Caledonia | 27,014 | 7,714 | 17,287 | 29,433 | 8,107 | 18,168 |
| South Africa | 18,310 | 7,730 | 17,323 | - | - | - |
| United States | 16,700 | 6,646 | 14,894 | 5,050 | 1,189 | 2,665 |
| Japan | 16,700 | 7,446 | 16,686 | - | - | - |
| Papua | 9,955 | 3,921 | 8,787 | 8,528 | 2,875 | 6,443 |
| Other | 14,686 | 4,850 | 10,869 | 17,551 | 6,011 | 13,471 |
| Total | 247,342 | 73,913 | 165,639 | 71,026 | 21,109 | 47,306 |

1/Preliminary.

Table 2 - Australian Exports of Raw Shrimp

| Destination | 1962/63 1/ | | | 1961/62 | | |
|---|---|---|---|---|---|---|
| | Qty. | Value | | Qty. | Value | |
| | Lbs. | A£ | US$ | Lbs. | A£ | US$ |
| Japan | 531,837 | 232,653 | 521,375 | 20 | 2 | 4 |
| United States | 372,492 | 132,706 | 297,394 | 17,300 | 6,066 | 13,594 |
| South Africa | 28,300 | 13,475 | 30,197 | 10,280 | 4,198 | 9,408 |
| France | 13,350 | 4,496 | 10,076 | 6,400 | 2,248 | 5,038 |
| Hong Kong | 8,640 | 2,870 | 6,432 | - | - | - |
| Other | 22,583 | 8,998 | 20,165 | 16,027 | 6,323 | 14,170 |
| Total | 977,202 | 395,198 | 885,639 | 50,027 | 18,837 | 42,214 |

1/Preliminary.

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MARKET FOR CANNED SARDINES AND PILCHARDS:

Canned sardines and pilchards are imported into Australia, principally from the United Kingdom, Canada, Denmark, West Germany, Norway, Portugal, and South Africa. A limited amount comes from Morocco, also certain other unspecified countries supply small amounts. There are no recorded imports of pilchards or sardines from the United States.

A very few sardines are imported in $1\frac{1}{2}$ oz. cans, and some in cases of 50 cans but the majority are imported in cases of 100 cans.

Few pilchards are imported into Australia from South Africa and are used primarily for native rations in New Guinea. These imports are declining because of complaints about the quality. (United States Consul, Sydney, September 19, 1963.)

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Australia (Contd.):

SOUTH AUSTRALIA'S 1963 TUNA LANDINGS NOT UP TO EXPECTATIONS:

Landings of tuna for the 1963 season in South Australia failed to reached the pre-season forecast of 5,000 short tons. Although the landings of 3,966 tons set another new record, the catch per vessel dropped from 191 tons in 1962 to 171 tons this season. The total landings of tuna in South Australia have increased each year since the start of the fishery in 1958 from 593 tons to 3,710 tons in 1962.

In contrast to the 1963 season as a whole, the first few weeks were extremely encouraging. The first catches were landed on December 23, but no further landings were received until January 11. The season was in full swing by the end of January, and at the end of February, landings had reached 1,931 tons--almost double the figure for the corresponding period in 1962--but this was not to last. In March, landings lagged, in April catches were poor, and the figures for May were well below the corresponding figures for 1962.

However, one bright feature of the season was the relatively abundant bait supply--but bait is of little use if the fish will not rise to feed.

The number of vessels increased this season--14 of the 18 vessels fishing last season returned and were joined by 9 others, giving a total of 23 vessels for the season. The loss, early in the season, of the 47-foot Smada emphasized the fact that tuna fishing can be a hazardous occupation. This was the second tuna boat to be lost without trace.

After last season's record landings, it was suggested that handling and freezing facilities available at Port Lincoln might not be sufficient to handle an increase in production. Such was not the case, and all tuna landed were accepted by the cannery or freezers.

A disappointing season from the point of view of most vessel owners has raised doubt as to the long-term potential of tuna fishing. At present the fishery is not subject to any control, and because the industry has had a boom period over the last few years, more vessels have been attracted to it. It would appear that there are sufficient vessels to handle the fish available.

Vessels are operating on immature fish, but it may be possible with the introduction of new techniques to exploit adult stocks and as a result greatly increase landings. However, a change from the bait and pole method to any other technique would involve considerable cost to the fisherman. (Fisheries Newsletter, August 1963.)

## Bahamas

JURISDICTION OVER TERRITORIAL WATERS AND ADJACENT SHELF ANNOUNCED:

The Colonial Secretary of the Bahamas has announced that the territorial waters of the Colony are delimited by a line drawn 3 miles from low water mark or, in the case of bays and estuaries, from a closing line drawn at first point where they narrow to 10 miles in the width. He pointed out, however, that the boundaries of the Colony include the area of the continental shelf which lies beneath the sea contiguous to the coasts of the Bahamas, and the Government of the Bahamas claims the right to enforce jurisdiction over this shelf. (United States Consulate, Nassau, September 20, 1963.)

## Cambodia

NEW FISHERIES SERVICE VESSEL BUILT WITH UNITED STATES AID:

In a ceremony on October 3, 1963, the United States Ambassador turned over to the Cambodian Fisheries Service a 31-foot steel vessel for use in research, development, and conservation of fresh-water fisheries. The vessel was constructed by a local firm at a cost of about US$14,000 to serve as a prototype for construction of four more for the Fisheries Service. The five vessels represent a United States grant to aid Cambodia in the development of its fisheries which contribute basic items in the Cambodian diet. (United States Embassy, Phnom Penh, October 15, 1963.)

## Canada

COMMITTEE ON BRITISH COLUMBIA FISHING INDUSTRY PROBLEMS APPOINTED:

The three Canadian Federal Government representatives on the Federal-Provincial Committee on price and wage disputes in the British Columbia fishing industry were announced October 18, 1963, by the Federal Minister of Fisheries.

Named as Federal representatives were the Area Director, Department of Fisheries, Vancouver, B. C., the Deputy Director of Investigations and Research, Department of Justice, Ottawa, and the Industrial Relations Officer, Department of Labor, Vancouver, B. C.

The decision to set up the committee was made in the summer of 1963, as the result of a dispute primarily concerning the minimum prices to be received by fishermen from the sale of fish in British Columbia. The dispute brought on what was considered to be a crisis in the west coast salmon fishing industry and led to a joint announcement by the Federal Minister of Fisheries and the Minister of Labor for British Columbia, in which they urged that fishing be resumed at once. Coupled with the appeal was the agreement by the Federal and Provincial governments to appoint a committee consisting of three representatives of each government to examine, in detail, the problems concerned with price and wage disputes in the British Columbia fishing industry and to submit to both Governments recommendations of action necessary to minimize interruptions of fishing operations in the future.

The three provincial representatives on the committee had been previously appointed by the British Columbia Government. (Canadian Department of Fisheries, Ottawa, October 18, 1963.)

Note: See Commercial Fisheries Review, September 1963 p. 59.

* * * * *

SALE OF SMOKED FISH IN AIR-SEALED CONTAINERS MAY BE PROHIBITED:

The Canadian Minister of Fisheries made the following statement in the House of Commons on October 30, 1963.

"The Departments of National Health and Welfare and of Fisheries have viewed with concern the recent evidence from the United States, associating death from botulism with the consumption of specific types of smoked fish.

"During the past three years, nine deaths and a number of non-fatal cases of illness have been shown to be due to the presence in the smoked fish, of a toxic substance produced by a bacterium called Clostridium botulinum Type E.

"No reports of similar illness have occurred in Canada during this period.

"Canadian consumers should be informed that cooking destroys the toxic substance. Therefore, any food product eaten immediately after thorough cooking is safe with regard to this type of poisoning.

"Investigators of the two Departments have had this problem under study for about two years. There is evidence to suggest that the practice of packing smoked fish in impermeable plastic wrappers increases the risk of botulism from this product.

"Accordingly, the two Departments are considering legislation to prohibit the sale of smoked fish packed in containers sealed to exclude air, unless the packaged product has been rendered commercially sterile by a suitable heat process." (Information Branch, Department of Fisheries, Ottawa, Canada, October 30, 1963.)

* * * * *

VESSEL CONSTRUCTION SUBSIDY PROGRAM:

The Canadian Ship Construction Assistance Program was announced in May 1961 and began to operate about six months later. By mid-October 1963, subsidy expenditures and commitments under the program had amounted to about C$59.6 million for some 238 vessels. In addition, subsidy applications had been filed for another 112 vessels, which, if approved, would raise the total cost of the program to about $110 million.

A number of the vessels subsidized have been scallop draggers, trawlers, and miscellaneous craft for fishermen. Other vessels aided by the subsidy have included ferries, barges, oil carriers, bulk carriers, harbor tugs, and a floating dry dock.

Canada (Contd.):

The subsidy rate was reduced on March 31, 1963, from 40 to 35 percent of the cost of construction. (The subsidy rate for the construction of steel fishing trawlers over 75 feet in length for operation out of Atlantic ports continues to be 50 percent.) Subsidy applications were reported to have dropped sharply after the rate reduction and new applications have been mainly for smaller vessels and barges. (United States Embassy, Ottawa, October 21, 1963.)

Note: See Commercial Fisheries Review, May 1963 p. 60.

## Denmark

LOANS AND GRANTS TO FISHERMEN FOR FISCAL YEAR 1963:

The Royal Danish Fisheries Bank in its 30th annual report and statement for the 1963 fiscal year (April 1, 1962-March 31, 1963), summarized the grants and loans to the Danish fishing industry.

During the 1963 fiscal year there were 158 applications for loans, slightly more than in the previous year. The Bank made 125 loans, totaling Kr. 14,257,700 (US$2,062,000) as compared with 160 loans amounting to Kr. 30,509,000 ($4,411,000) in the previous year. The loans were divided as follows in fiscal 1963: purchase of new vessels, 92 (US$1,904,000); purchase of used vessels, 4 ($14,387); purchase of new motors, 5 ($21,905); used for industrial purposes, 8 ($91,888); for rubber life raft, 1 ($246); and reorganization loans for fishermen in difficulties ($29,135).

There were no losses on loans during the year. Funds on loan increased to Kr. 88,154,347 ($12,746,000) in fiscal 1963. Loan payments amounted to Kr. 7,578,577 ($1,096,000). Interest paid totaled Kr. 5,041,262 ($729,000).

On April 23, 1963, the law governing the operations of the Bank was modified to increase the maximum total which might be loaned from Kr. 100 to 150 million ($14,459,000-$21,689,000), and to permit loans in Greenland as well as in Denmark and the Faroe Islands. The advisory board for the management was expanded to include one representative from each of the two large fishermen's associations, one each from 5 processing and marketing organizations, and one each for Greenland and the Faroe Islands, (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, October 9, 1963.)

* * * * *

MARINE OIL FOREIGN TRADE, JANUARY-JUNE 1962-1963:

In the first half of 1963, Danish imports of marine oils were about the same as in the same period of 1962, but exports of marine oils were up sharply due to heavier landings

Danish Imports and Exports of Marine Oils, January-June 1962-1963

| Item | Imports | | Exports | |
|---|---|---|---|---|
| | January-June | | | |
| | 1963 | 1962 | 1963 | 1962 |
| | (Metric Tons) | | | |
| Fish oil | 12,884 | 12,026 | 8,148 | 3,728 |
| Whale and seal oil, crude | 14 | 48 | 77 | 62 |
| Marine oils, refined or hardened | 2,726 | 1,814 | 593 | 2,246 |

of industrial fish in the first part of 1963. (United States Embassy, Copenhagen, October 7, 1963.)

* * * * *

ORDER RECEIVED FROM CHILE FOR FISH-FREEZING PLANT:

After intense international competition, a Danish firm has obtained a Chilean order for a complete fish-freezing plant.

The fish-freezing plant will include 10 modern high-speed multicylinder compressors type SMC with direct coupled electric motors, with a total of 720 hp. Four of the compressors will work as booster compressors, as temperatures down to -35° F. occur, and the ammonia gas will therefore have to be compressed in several stages.

Only modern compressors were considered, as a limitation of the electric supply is of great importance for economic operation, which is possible with the Danish firm's multicylinder compressors through a perfect capacity regulation system.

The plant will be capable of freezing 190,000 pounds of tuna per day; cooling 350,000 pounds of sardines and tuna per day; and producing 33,000 pounds of flake ice per day. It will maintain temperatures of -13° F. in cold storage for 2.2 million pounds of frozen fish; and +10° F. in cold storage for 175,000 pounds of

Denmark (Contd.):

flake ice; and +30° F. in a large packing and handling room.

The same Danish firm has delivered a tunnel freezing system capable of freezing 50 tons a day to a Copenhagen firm building a freezer plant for a Soviet account. This makes the 23rd such order to be delivered by this firm for Soviet owners since the Second World War. (World Fishing, October 1963.)

## Ecuador

FOREIGN MINISTER RESTATES POLICY ON LAW OF THE SEA:

The Ecuadoran Foreign Minister in early October 1963 restated his Government's policy regarding the Law of the Sea (Territorial Waters, the Continental Shelf, and Fishing Limits). His statement follows:

"I believe that although guided by great zeal and patriotic interest persons who have not had the occasion to treat with these questions in depth frequently confuse different concepts which in order to avoid false understandings must be defined with precision and clarity. These concepts are three: Concept of territorial sea, the concept of continental shelf, and the concept of maritime zones or fisheries zones for protection and conservation.

"(1) With respect to the concept of territorial sea, it is necessary to bear in mind that the territorial sea of the Republic is established by Ecuadoran law, which by sovereign act has fixed it at 12 miles.

"(2) With respect to the concept of continental shelf this also is found established in a sovereign act of the State, by Ecuadoran law, which fixes it at up to a depth of 200 meters.

"(3) With respect to the concept of a maritime zone and fisheries zones for protection and conservation it is appropriate to mention the existence of the Declaration on Maritime Zones formulated August 16, 1952 by Ecuador, Peru, and Chile in which the 3 countries with the purpose of conserving and assuring for their people the natural riches of the sea adjoining their coasts proclaimed as a norm of their foreign policy, protection over a 200-mile zone. During the 13th Session of the United Nations General Assembly, representatives of the 3 countries explained to the world community the true legal scope and the real significance of the Declaration on Maritime Zones, which has an economic and scientific meaning for the adequate protection of the live resources of the sea adjoining the coasts of the three countries, and for their preferred exploitation by these countries, because of their geographic position, geological factors, and the necessities of their people, and their development. During the consultations held in Quito at the beginning of 1958 between representatives of the 3 countries, they made it clear in their joint report that the Declaration on Maritime Zones did not alter the extent of their respective territorial seas of the signatory states, which therefore, is determined, as is obvious, by the sovereign law of each one of the said states.

"(4) Thus with these 3 concepts properly established and appropriately distinguished it is easy to understand the political, juridical and other consequences of each. In this respect Ecuador has very carefully sought to distinguish with legal and technical precision those concepts in its foreign policy, in its presentations before international meetings, such as the United Nations Conference on the Law of the Sea, in which it has defined on the one hand, in accordance with its sovereign law, a territorial sea of 12 miles--which is gaining increasing international acceptance--, has won acceptance of a continental shelf up to a depth of 200 meters, and has proclaimed, on the other hand its preeminent right to preferential exploitation with respect to other states of the resources of the sea adjoining its coasts, and its special right, inherent in its geographic position, to protect and conserve them, a preeminent right and special power that is translated in a fisheries zone, adjacent to its territorial waters, sufficiently extensive for the realization of its essential purposes and the adequate protection of national interests. It is an easily proven fact that the seriousness and logic of the Ecuadoran juridical position, which has developed standing with time, has been bringing increasingly beneficial results and favorable recognition within the concert of nations.

"(5) It is hardly necessary to affirm that no action by the Foreign Ministry will affect in any way the position firmly assumed by Ecuador on these matters nor therefore the

Ecuador (Contd.):

rights maintained thereby." (United States Embassy, Quito, October 5, 1963.)

* * * * *

LAW AMENDED ON TAX TREATMENT OF FOREIGN FREEZERSHIPS PURCHASING FROM FISHERMEN FOR EXPORT:

The tax treatment on refrigerated ship operation entailing purchase of fish from local fishermen for export by Ecuador was amended in Decree No. 415 published in Official Register No. 58, dated September 18, 1963.

This Decree amends Article 36 of the Law of Maritime Fishing and Hunting so that it is now clearly set forth that fish exports by a foreign flag vessel engaged in the purchase of fish from local fishermen for export abroad (this requires a concession granted by the central Government) are exempt from export taxes specified in Article 36. Foreign flag vessels engaged in that kind of operation remain subject to the payment of costs for a matricula and fishing license as set forth in Articles 23 and 29 of the Law.

This amendment is significant in that it is now stated in law that exports of fish under this kind of operation are subject only to the prior purchase of a matricula and fishing license and are not subject to payment of export taxes in addition. (United States Embassy, Quito, October 11, 1963.)

## El Salvador

INCREASED DUTY RATES FOR CANNED MACKEREL PROPOSED:

The San Jose (Costa Rica) Protocol of July 31, 1962, to the Central American Convention on the Equalization of Import Duties, calls for a common external tariff on canned mackerel of $30 per 100 kilograms (about 13.6 U. S. cents a pound) plus 30 percent ad valorem.

This duty will become effective when three of the contracting countries have deposited their ratification of the Protocol, but will be effective only for the three countries so ratifying. It will not operate in the rest of the countries until they too have deposited their ratification. To date, only Guatemala and Costa Rica have completed the necessary procedures.

The new prescribed rate, therefore, is not yet effective in those countries. For El Salvador, the new rate is of a progressive nature and will be reached only after the following five-year transitional period:

| Year | Specific | | Ad Valorem |
|---|---|---|---|
| | US$/100 Kgs. | US¢/Lb. | Percent |
| 1st | 5 | 2.268 | 10 |
| 2nd | 10 | 4.535 | 14 |
| 3rd | 15 | 6.803 | 18 |
| 4th | 20 | 9.071 | 22 |
| 5th | 25 | 11.339 | 26 |

Thereafter, the duty will be the prescribed $30/100 kilograms, plus 30 percent ad valorem.

The current preferential duty of $5/100 kilograms (2.268 U. S. cents a pound) plus 6 percent ad valorem will remain in effect until El Salvador deposits the instrument of ratification of the San Jose Protocol. At that time, the duty will start to progress as specified, with the only increase during the first year being a rise of 4 percent in the ad valorem duty. There are no indications that El Salvador intends to ratify the San Jose Protocol in the immediate future. (United States Embassy, San Salvador, October 10, 1963.)

## Faroe Islands

FISHING GEAR DAMAGED BY FOREIGN FISHING FLEETS:

The Faroe Islands fishing fleet in August 1963 suffered some damage and loss of gear from the activities of a large Soviet fleet fishing for herring mostly north of the Faroe Islands. A Soviet gill netter drifted down on a Faroese herring purse seiner, damaging it so severely it had to be sent to Iceland for repairs. It is not known whether the purse seiner will be compensated by the Soviet Government for the damage suffered.

Faroese gill netters sometimes lose gear to Soviet vessels because the Soviets fish at all times and in all directions in accordance with instructions from their research vessels as to the course of the herring. The Faroese fish more according to the direction of winds and currents.

When Soviet fleet depot vessels go into Faroese ports for water or shelter, Faroese

Faroe Islands (Contd.):

claims for damage are brought to their attention. The Soviet leader sometimes offers an equivalent number of gill nets to replace those damaged. At other times he may state the fault was equal and no nets are offered. The Soviet tank ships obtain water in Thorshavn and fleet vessels may seek shelter from bad weather in Fuglefjord.

Damage to Faroese longlines by United Kingdom trawlers was said to be much greater than damage caused by the Soviet vessels to Faroese gear. (Regional Fisheries Attache for Europe, U. S. Embassy, Copenhagen, September 18, 1963.)

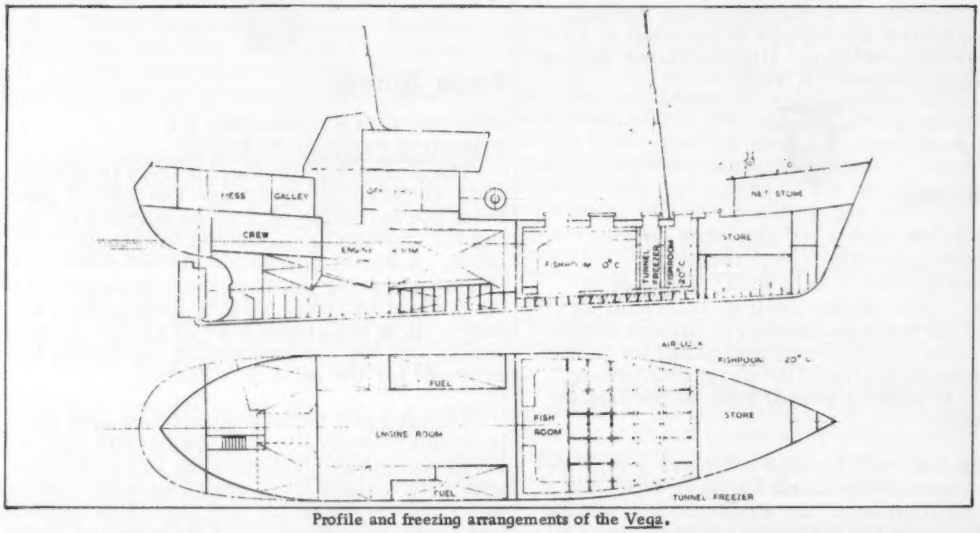
## France

NEW SIDE TRAWLER EQUIPPED TO FREEZE PART OF CATCH:

A French shipyard has completed a 123-foot 6-inch over-all side trawler (Vega), designed to freeze one ton of fish per day out of her catch. The Vega differs from the accepted concept of a part-freezer, in that there is no intention of freezing the first part of the trip and then switching to icing, in order to extend the voyage. This would seem to be a pilot scale experiment in order to explore the possibility of marketing fish frozen individually in the round. It is pointed out that the existing tunnel freezer can be duplicated later and that the low temperature fishroom is large enough (706 cubic feet) to take the output of an extra freezer. It is also noteworthy that the fish will be frozen separately rather than in blocks and that they may be ice glazed, though whether it is intended to concentrate on prime fish which would repay this more expensive treatment is not stated.

In addition to the low temperature fishroom, there is a normal, glass wool insulated chilled fishroom forward of midships, and this has a capacity of 3,335 cubic feet. The tunnel freezer, operating at minus 30°-35° C. (-22°-31° F.), is situated between the main fishroom and the low temperature fishroom, and it is served by a cooled working area, kept at 0° C. (32° F.) and having access via a separate hatch.

The main engine of the Vega is a 6-cylinder Diesel, developing 800 brake horsepower at 380 r.p.m. and driving a fixed propeller through a two-speed reverse-reduction gear to give propeller speeds of 200 or 250 r.p.m. Speed is 12 knots, and the crew numbers 16. The 6-ton trawl winch is powered by three hydraulic motors, the pressure pump being driven by the main engine.




Profile and freezing arrangements of the Vega.

In other respects, the Vega is a conventional side trawler, fishing from both sides. (World Fishing, October 1963.)

## Greece

FISHERIES TO BE DEVELOPED UNDER 5-YEAR PLAN:

A five-year plan for the development of Greek fisheries is being drawn up by the Fisheries Department of the Ministry of Industry. Investigations are under way concerning (1) the existing organic population of Greek waters, (2) possibilities for expanding the fresh-water stocks of various fish through improved breeding, (3) possibilities for expanding the salt-water beds of oysters through the establishment of new oyster colonies, and (4) Government aid to the high-seas fishing fleet to enable it to move further afield in the Atlantic instead of confining itself to the coast of West Africa. (United States Embassy, Athens, September 27, 1963.)

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LANDINGS BY LARGE FREEZERSHIPS HIGHER FOR JANUARY-AUGUST 1963 PERIOD:

The Greek fleet of large freezership and refrigerated trawlers fishing in Atlantic waters during August 1963, landed 1,350 metric tons of frozen fish. This compares with 1,385 tons landed by five vessels in August 1962.

The same flect of vessels landed 11,546 tons of frozen fish during the first nine months of 1963, or an average 1,443 tons per month. In the similar period of 1962, a total of 10,057 tons were landed by the Greek freezership fleet. (Alieia, September 1963.)

## Iceland

EXPORTS OF FISHERY PRODUCTS TO SOVIET BLOC, JANUARY-JUNE 1963:

Exports of fishery products by Iceland to the Soviet Bloc countries during January-June 1963 amount to 41,529 metric tons valued (f.o.b.) at Kr. 387.7 million (US$9 million). Exports of frozen fillets and salt herring to the Soviet Union decreased as compared with the first six months of 1962, but an increase in the exports of frozen herring partially compensated for the decline. Exports to Hungary, Rumania, and Poland increased in January-June 1963 from the same period of 1962 (see table). (United States Embassy, Reykjavik, October 9, 1963.)

Iceland's Exports of Fishery Products to Soviet Bloc, January-June 1963

| Country & Commodity | Quantity | Value (f.o.b.) | |
|---|---|---|---|
| | Metric Tons | 1,000 IKr. | US$1,000 |
| Bulgaria: | | | |
| Cod-liver oil | 120 | 813 | 19 |
| Czechoslovakia: | | | |
| Frozen herring | 1,729 | 10,459 | 243 |
| Frozen fish fillets | 395 | 6,503 | 151 |
| Canned fish | 16 | 972 | 23 |
| Herring meal | 1,210 | 7,387 | 172 |
| Cod-liver oil | 300 | 2,737 | 64 |
| Total | 3,651 | 28,058 | 653 |
| East Germany: | | | |
| Frozen herring | 1,734 | 10,145 | 236 |
| Salted herring | 1,863 | 17,015 | 395 |
| Total | 3,598 | 27,160 | 631 |
| Hungary: | | | |
| Frozen fish fillets | 75 | 1,311 | 30 |
| Canned fish | - | 40 | 1 |
| Fish meal | 520 | 3,285 | 76 |
| Total | 596 | 4,636 | 107 |
| Poland: | | | |
| Frozen herring | 1,500 | 8,940 | 208 |
| Salted herring | 3,000 | 26,253 | 610 |
| Herring meal | 3,500 | 22,939 | 533 |
| Cod-liver oil | 220 | 2,120 | 49 |
| Total | 8,220 | 60,252 | 1,400 |
| Rumania: | | | |
| Frozen herring | 3,202 | 18,997 | 441 |
| Salted herring | 2,530 | 20,355 | 473 |
| Cod-liver oil | 155 | 1,140 | 26 |
| Total | 5,887 | 40,492 | 940 |
| U. S. S. R.: | | | |
| Frozen herring | 6,803 | 35,111 | 815 |
| Frozen fish fillets | 10,677 | 169,016 | 3,925 |
| Salted herring | 1,922 | 19,012 | 442 |
| Canned fish | 53 | 3,103 | 72 |
| Total | 19,457 | 226,242 | 5,254 |
| Grand total | 41,529 | 387,653 | 9,004 |

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UTILIZATION OF FISHERY LANDINGS, JANUARY-APRIL 1963:

| How Utilized | January-April | |
|---|---|---|
| | 1963 | 1962 |
| | (Metric Tons) | |
| Herring[1/] for: | | |
| Oil and meal | 52,526 | 22,862 |
| Freezing | 12,113 | 9,592 |
| Salting | 6,348 | 3,182 |
| Fresh on ice | 5,456 | 5,375 |
| Canning | - | 69 |
| Groundfish[2/] for: | | |
| Fresh on ice | 14,410 | 14,930 |
| Freezing and filleting | 83,080 | 80,568 |
| Salting | 47,731 | 58,881 |
| Stockfish (dried unsalted) | 41,881 | 28,255 |
| Canning | 35 | - |
| Home consumption | 4,919 | 4,246 |
| Oil and meal | 1,013 | 971 |
| Shrimp for: | | |
| Freezing | 267 | 230 |
| Canning | 82 | 79 |
| Lobsters for: | | |
| Fresh on ice | 2 | - |
| Freezing | 2 | - |
| Total production | 269,865 | 229,240 |

1/Whole fish.
2/Drawn fish.

* * * * *

Iceland (Contd.):

## FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-APRIL 1963:

| Species | January-April | |
|---|---|---|
| | 1963 | 1962 |
| | (Metric Tons) | |
| Cod | 142,221 | 143,761 |
| Haddock | 20,883 | 16,795 |
| Saithe | 4,663 | 6,275 |
| Ling | 3,432 | 4,694 |
| Wolffish (catfish) | 9,111 | 7,936 |
| Cusk | 4,041 | 3,650 |
| Ocean perch | 7,025 | 2,735 |
| Halibut | 340 | 489 |
| Herring | 75,365 | 41,080 |
| Shrimp | 349 | 309 |
| Capelin | 1,077 | - |
| Other | 1,358 | 1,516 |
| Total | 269,865 | 229,240 |

Note: Except for herring which are landed round, all fish are drawn weight.

* * * * *

## HERRING FISHERIES TRENDS, JANUARY-SEPTEMBER 1963:

The main herring season (mid-June through about mid-September) in Iceland ended on September 21, 1963, a week later than in 1962. Despite pessimism during the first half of the season, the total 1963 summer herring catch reached the same level as the 1961 season, which was second only to the 1962 record catch.

Herring landings during the 1963 main season were 33.9 percent below the total catch for the same period in 1962, but 92.6 percent above the 1960 yield. As in 1962, 224 vessels participated in the herring fisheries during the better part of the 1963 season. Cold and stormy weather prevailed on the herring grounds throughout most of the season. Factors contributing to the favorable 1963 summer season were larger and better equipped vessels, the general use of electronic fish finding equipment, and the adoption of new fishing techniques. It was generally maintained that the 1963 season would have been a drastic failure if the vessels had depended entirely on the purse-seine gear which predominated in the fishery prior to 1958.

Because of the excellent quality of the herring and larger sales contracts, a greater quantity of herring was salted in 1963 than in any previous year. The ex-vessel value of the summer herring catch to the fishing fleet in 1962 and 1961 amounted to IKr. 413 million (US$9.6 million) and IKr. 259 million ($6.0 million), respectively. The Fisheries Association of Iceland has not yet calculated the ex-vessel value of the 1963 summer herring catch. However, because of the large share delivered for salt processing, it is estimated that the value of the 1963 yield will not be too far below the 1962 ex-vessel value.

Prices for salted herring are slightly higher than in 1962. Prices for herring oil have also made a sharp recovery, increasing from the all-time low of £29 ($81.20) per metric ton (c.i.f. Continental port) in mid-October 1962 to £66 ($184.80) per metric ton in the fall of 1963. The herring industry benefited only to a small extent from the price advance because the bulk of the herring oil production had been contracted for in advance for £45-50 ($126-140) per metric ton. Stocks of unsold herring oil from this summer's production amount to only a few hundred metric tons. In contrast, there are considerable stocks of herring meal on hand. Prices for herring meal have declined from about 16 shillings ($2.24) per protein unit earlier this year to 14 shillings ($1.96) c.i.f. Continental port.

Table 1 - Iceland's Catch and Utilization of Summer Herring, 1961-1963

| How Utilized | 1963 | 1962 | 1961 |
|---|---|---|---|
| | (Metric Tons) | | |
| Salting | 62,537 | 50,683 | 49,105 |
| Reduction (meal & oil) | 151,748 | 273,648 | 166,472 |
| Freezing | 3,312 | 4,212 | 2,374 |
| Total catch | 217,597 | 328,543 | 217,951 |

Table 2 - Iceland's Advance Sales Contracts for Salted Herring, 1963

| Country | Cut Herring 1/ | Spiced Herring 2/ | Total |
|---|---|---|---|
| | (Barrels 3/) | | |
| Denmark | 2,150 | 6,650 | 8,800 |
| Finland | 1,275 | 61,900 | 63,175 |
| Israel | - | 6,000 | 6,000 |
| Norway | - | 1,700 | 1,700 |
| Sweden | 70,525 | 95,900 | 166,425 |
| Soviet Union | 120,000 | - | 120,000 |
| United States | 15,560 | 1,820 | 17,380 |
| West Germany | 6,450 | 4,200 | 10,650 |
| Total | 215,960 | 178,170 | 394,130 |

1/Heads-off.
2/Spiced or sugar salted or both.
3/A barrel contains approximately 100 kilograms (220 pounds).

Prior to and during the early part of the 1963 summer herring season, Iceland had arranged advance sales contracts for 394,130 barrels of salted herring. Reportedly, the sales contracts for salted herring from the 1963 season yielded approximately IKr. 420 million ($9.75 million).

In 1962, advance sales of salted herring from summer production amounted to 334,626 barrels. This year, Sweden and the Soviet Union increased their advance contracts by 25,544 barrels and 20,000 barrels, respectively. A considerable quantity of surplus stocks from 1962 production (originally intended for local consumption) was sold to Sweden. In addition, the United States purchased 4,960 barrels more of salted herring this year. (United States Embassy, Reykjavik, October 15, 1963.)

# Italy

## TUNA PACKERS ASSOCIATION SEEKS AID FROM JAPANESE PRODUCERS:

The Italian Tuna Packers Association, which is seeking government authorization to increase the 1964 duty-free frozen tuna import quota from 40,000 metric tons to 60,000 metric tons, is said to have again presented to the Japan Export Frozen Tuna Producers Association a request that Japan: (1) contribute 300 million lira (US$480,000) to the Italian tuna promotion program; (2) endeavor to include greater quantities of yellowfin tuna in frozen tuna shipments to Italy; and (3) provide quality guarantees on frozen tuna shipments similar to those given to United States packers.

Italy (Contd.):

The Japan Frozen Tuna Producers Association was scheduled to call a formal meeting to study the Italian request, but indications were that the Association would be willing to contribute, at the most, a sum equal to only one-half of the total of 12.5 million yen (US$34,723) allocated for tuna publicity in the United States. (Suisan Tsushin, October 22, 1963.)

## Japan

BERING SEA FISHERIES TRENDS, OCTOBER 1963:

The Shikishima Maru (5,871 gross tons) fleet is reported to be the top money-making fleet among the 19 mothership-type bottom fishing fleets which operated in the Bering Sea in 1963. Some fleets, particularly the smaller fleets which primarily employed long-line gear in the halibut fishery, are reported to have operated at a deficit.

The financial success of the Shikishima Maru fleet, which fished with 18 catcher vessels, is attributed to avoidance of regular fishing grounds and development of new grounds. The fleet is reported to have fished principally for herring in the vicinity of 170° E. long.-60° N. lat. (off Cape Olyutorskii) and for Pacific ocean perch along 180° long. just north of the Rat Islands in the Aleutian Islands chain.

The Dainichi Maru (5,859 gross tons) king crab fleet, which operated in the eastern Bering Sea, returned to Hakodate on October 1, after meeting its production target of 115,000 cases (½-lb. 48 cans/cs.). The fleet was reported to have averaged 9.8 crabs per tan (shackle) and 23 crabs per case. (Hokkai Suisan, October 7, 1963.)

* * * * *

BERING SEA BOTTOMFISH FISHERY MAY BE CURTAILED:

Officials of the Japanese Fisheries Agency and the Northern Waters Bottomfish Mothership Council met on October 14, 1963, to discuss the condition of bottomfish resources in the northern waters and operational plans for 1964. The Fisheries Agency is reported to have expressed the opinion that industry should curtail its operations in the Bering Sea in 1964 in view of management and resource problems. The Mothership Council plans to review and evaluate the data submitted at that meeting in formulating operational plans for 1964. (Suisan Tsushin, October 15, 1963.)

* * * * *

FISHERMEN REQUEST PERMISSION TO ENTER TUNA FISHERY:

Japanese purse-seine-type net fishermen from the Hokuriku-Sanin districts (prefectures bordering the Japan Sea) submitted a petition on October 9, 1963, to the Fisheries Agency Director requesting assistance in overcoming the depressed state of their fisheries. Specifically, they seek to have their present fleet strength reduced in half and have those vessels retired from the surrounding or purse-seine-net fishery licensed to fish for tuna. (Shin Suisan Shimbun Sokuho, October 10, 1963.)

* * * * *

DANISH TRADERS REQUEST OFFERS OF JAPANESE TUNA:

Japanese trading firms are reported to be showing interest in Sweden and Denmark as possible tuna export markets following receipt of bidding invitations from Denmark. It was reported that Danish trading firms were specifying that the shipments must consist of tuna only. In some cases, they have specified bluefin tuna only . Some firms have listed the final (consumption) destination as Sweden, but it is not known whether the tuna will be canned or smoked. (Suisan Tsushin, October 8, 1963.)

* * * * *

MARKET FOR FROZEN TUNA EXPORTS TO UNITED STATES DULL IN SEPTEMBER:

The price of Japanese frozen tuna exported to the United States stopped rising in mid-September 1963. As of early October, United States tuna canners were not buying any Japanese tuna. Occasional offers made by United States buyers were $330-340 a short ton for round albacore and $295 a short ton for gilled-and-gutted yellowfin (both prices f.o.b. Japan). However, Japanese exporters were not willing to sell at those prices.

The export price for tuna loins has declined by $30-40 per short ton since early September. Japanese exporters said that they were unable

Japan (Contd.):

to sell albacore loins f.o.b. to the United States for more than $840 a short ton and yellowfin loins for more than $735 a short ton. (Suisan Tsushin, October 3, 1963.)

* * * * *

PRICES FOR FROZEN BIG-EYED TUNA IN CZECHOSLOVAKIA LOWER:

Catches by the Japanese tuna long-line vessels operating in the Atlantic Ocean as of late September 1963 were still largely big-eyed. As a result, Japanese tuna exporters were actively trying to sell that species to Czechoslovakia, which is the only European country willing to accept pure shipments of big-eyed tuna. During the first 9 months of 1963, a total of about 3,000 metric tons of tuna (2,500 tons big-eyed and 500 tons skipjack), were estimated to have been contracted for delivery to Czechoslovakia.

The export price of big-eyed tuna shipped to Czechoslovakia (delivery Hamburg, Germany, or Trieste, Italy) as of early October declined below $320 a metric ton. In mid-September Czechoslovakia purchased big-eyed tuna for $335 a metric ton. (Suisan Tsushin, October 5 and September 16, 1963.)

* * * * *

OWNERS OF OVERSEAS-BASED TUNA VESSELS SEEK TO ADD FREEZING EQUIPMENT:

Owners of overseas-based Japanese tuna vessels, now permitted to operate only fresh fish carrying vessels (ice boats) at certain overseas bases, are seeking Government approval to install refrigeration equipment in their fishing vessels. This would permit them to extend the range of operation of their vessels beyond present fishing grounds where catches are reported to be declining.

Japanese producers and exporters of frozen tuna, however, are said to be opposed to that plan. They claim that delivery of frozen tuna to overseas bases, such as to Samoa, is not consistent with current regulations, which are very strict with regard to the landing of frozen tuna in foreign countries for export purposes. They may not be opposed to the vessel conversion program if satisfactory measures can be developed to control such landings. (Suisan Tsushin, October 2, 1963.)

* * * * *

ORDER FOR OWNERS TO CONVERT VESSELS TO PORTABLE-BOAT-CARRYING TUNA MOTHERSHIPS EXTENDED:

The Japanese Fisheries Agency announced on October 10, 1963, that owners of large tuna vessels fishing with portable boats or who intend to do so will have until September 30, 1964, to convert their tuna vessels to "full-fledged" portable-boat-carrying tuna motherships. They were required to file their intentions by November 30, 1963. Should they not be able to convert their vessels by the September 1964 deadline, vessel owners will be granted a grace period until 1967, only if it can be shown that they definitely intend to convert their vessels.

"Full-fledged" portable-boat-carrying tuna motherships are described as those which carry their portable boats (restricted to a maximum size of 20 tons gross) on their decks. Many operators of large tuna vessels, through a loose interpretation of existing regulations, are fishing with portable boats which they suspend on the stern of their "motherships" when in port. On the way to the fishing grounds, the portable boats are lowered into the water and towed to the fishing grounds or made to travel to the grounds on their own power.

A total of 64 tuna vessel owners are affected under the Agency's directive, which is aimed at correcting this and other loopholes in the law. Vessel owners were required to file their intentions by November 30 as to whether they wished to have their vessels licensed as "full-fledged" portable-boat-carrying tuna motherships, otherwise their vessels would be licensed as regular distant-water tuna vessels.

Under current Government regulations, the operation of two classes of portable-boat-carrying tuna motherships is authorized; those under 2,000 tons gross, called Class I motherships, and those over 2,000 tons, called Class II motherships. Class I motherships are authorized to engage directly in fishing but Class II vessels are not. (Suisan Tsushin and Suisan Keizai Shimbun, October 12, 1963, and other sources.)

* * * * *

STUDY OF UNITED STATES CANNED TUNA IMPORT QUOTAS REQUESTED:

According to the Japanese Fisheries Agency's Production Chief, who accompanied the Minister of Agriculture and Forestry on the

Japan (Contd.):

Minister's trip to Canada and the United States, the U. S. Government, at the request of the Japanese Minister, agreed to complete a study of the problem on United States canned tuna import quotas before the United States-Japan economic (ministerial-level) conference convened in November at Tokyo. The Japanese Minister's request was initiated on behalf of Japanese canned tuna producers, who are seeking adjustments in 1964 in the amount of canned tuna in brine that can be admitted into the United States under the lower tariff rate of 12½ percent ad valorem. (Suisan Tsushin, October 9, 1963, and other sources.)

* * * * *

TUNA FISHING BASE AT NEW CALEDONIA ACTIVATED:

Tuna fishing operations at the Japanese base at Noumea, New Caledonia, which started on July 29, 1963, are reported to be progressing satisfactorily. As of September, 18 100-ton Japanese tuna vessels were operating out of that base. Their catches are being frozen on board the freezership Eiyo Maru (2,600 gross tons) which is anchored at Noumea. By March 1964, the tuna fleet is expected to be increased to a total of 35 vessels.

Tuna production in August is reported to have totaled 145 metric tons of tuna; in September, 299 tons. Production target for the base for the next six months is (in metric tons): October, 819; November, 922; December, 1,000; January 1964, 1,200; February, 1,500; and March, 1,750.

The tuna base, operated jointly by a Japanese firm and a French firm, has an export quota of 7,500 metric tons a year. (Shin Suisan Shimbun, September 30, 1963.)

* * * * *

TUNA FISHERMEN TRAINING PROGRAM PLANNED:

The Central Tuna Fishery Cooperative Association (an organization of vessel owners granted licenses in 1962 to construct 100-ton-class tuna vessels under the Government's plan to aid depressd coastal fisheries) plans to conduct a tuna fisherman training program. Objective of the program is to train a selected group in tuna fishing techniques. The Association plans to charter three 200 to 300-ton tuna vessels and hopes to train a total of 50 to 60 fishermen over a period of three years. The first training vessel was scheduled to depart Japan in November 1963 on a 95-day trip. The trainees, who will undergo one year of training, will receive a daily allowance of 400 yen (US$1.10), which will be paid from catch proceeds. (Suisan Tsushin, October 2, 1963.)

* * * * *

TWO FIRMS MAY END TUNA MOTHERSHIP OPERATIONS IN SOUTH PACIFIC:

Two Japanese fishing companies were reported to be considering terminating their tuna mothership operations in the South Pacific next year. The company which operated the tuna mothership Nojima Maru (8,800 gross tons) was said to have lost 120 million yen (US$333,000) in this year's operation. Another company, whose tuna mothership Yuyo Maru (5,500 gross tons) was still on the fishing grounds in late October 1962, was also expected to suffer heavy operational losses.

The operational deficits of the 2 mothership fleets were attributed to the decline in catch rate, from an average of 2.7 metric tons (daily catch per catcher vessel) in earlier years to 2.0 metric tons this year. Also, because of indications of a continuing decline in tuna availability in the South Pacific over the past few years, the two Japanese companies were reported to have encountered considerable difficulty in signing up operators of 100-ton vessels to fish for their fleets. Moreover, vessels of this class, which are considered most suitable for mothership-type operations, have greatly decreased in the past few years, being replaced by larger and newer vessels.

The Nojima Maru, which returned to Japan in the fall of 1963, was reported to have met only 85 percent (6,792 metric tons) of her catch target of 8,000 metric tons, despite having extended her operations by about a month. Similarly, the Yuyo Maru was reported to have met, as of October 21, only 81 percent (6,500 metric tons) of her catch target of 8,000 metric tons, despite having also extended her fishing operations by about a month.

As an alternative to cancelling their South Pacific tuna mothership operations next year, the two Japanese companies are reported to be considering the following possibilities: (1) transferring their mothership operations to the Atlantic Ocean (the Japanese Fisheries Agency is said to be opposed to this idea); (2) seeking authorization to establish bases overseas and applying their present mothership catch quotas to their base operations; and (3) operating Type II portable-boat-carrying tuna motherships (vessels over 2,000 gross tons). (Suisan Keizai Shimbun, October 24, 1963.)

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FEDERATION REQUESTS PERMIT TO IMPORT HERRING FROM U.S.S.R.:

The Hokkaido Federation of Fishermen's Cooperative Associations has submitted a request to the Ministry of Agriculture and Forestry for a foreign fund allocation of US$320,000. The allocation, if approved, will be used to purchase 3,000 metric tons of herring from the Soviet Union. A Japanese trad-

Japan (Contd.):

ing firm has already successfully negotiated a contract to import that amount from the Soviet Union. (Hokkai Suisan, October 7, 1963.)

* * * * *

FISH MEAL PURCHASED FROM SOUTH AFRICA:

The Japan Fish Meal Importers Association has concluded a contract with the Fish Meal Producers Association of South Africa to purchase from that organization about 20,000 metric tons of fish meal by the end of 1963. (Suisan Keizai Shimbun, October 13, 1963.)

* * * * *

RENEWAL OF KELP HARVESTING AGREEMENT WITH SOVIETS REQUESTED:

The President of the Japan Fisheries Society has contacted the Soviet Embassy in Tokyo requesting the renewal of the one-year private kelp fishery agreement concluded with the Soviet Union in June 1963. Under the agreement, Japanese fishermen were given assurances that they would not be molested by Soviet patrol vessels in fishing for kelp in a 4.5 square mile area in the Nemuro Strait off northern Hokkaido. On their part, Japanese kelp fishermen, in addition to observing certain fishing regulations, were required to pay a harvesting fee of US$33 per vessel for the season. A total of 300 Japanese kelp vessels were authorized to fish in the restricted area, which was marked off by buoys. They are reported to have harvested a total of 3,000 metric tons of kelp. (Minato Shimbun, October 2, 1963; and other sources.)

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PROHIBITION OF HIGH-SEAS PINK SALMON FISHING PROPOSED BY SOVIETS:

The Soviet Fisheries Minister is reported to have told the Japanese Minister of Agriculture and Forestry, during the latter's visit to Moscow in early October 1963, that pink salmon fishing should be completely prohibited. The Soviet Union had made a similar proposal at the Seventh Annual Meeting of the Northwest Pacific Fisheries Commission (Japan and U.S.S.R.) but the fact that the Soviet Minister has once again expressed a firm position on this matter is said to have come as a shock to the Japanese industry, even though the industry had somewhat anticipated it.

In connection with this problem, the Japanese National Federation of Salmon Gill-Net Fishermen's Association (ZENKEIREN) was scheduled to meet with the Fisheries Agency, beginning October 18, to exchange views on salmon negotiations with the Soviet Union. The Association was reported to be planning on stressing to the Agency the many inconsistencies in the present method of evaluating salmon resources.

Under the present method, the condition of the salmon resources is assessed by collectively analyzing the high-seas catch, inshore catch, and escapement. The Association claims that, under this system, the decline in the high-seas catch is considered indicative of a decline in resources and the system fails adequately to take into account the fact that catch quotas are being reduced, closed areas expanded, and fishing seasons shortened, all of which contribute to catch decline. Also, in the case of the salmon mothership fishery, the fleets tend to avoid areas of concentration of pink salmon and concentrate on catching red salmon. Thus, reduced catches of pink salmon on the high seas are not necessarily proof that pink salmon resources are declining.

The Association, in view of what it considers shortcomings in the present method of evaluating salmon resources, was expected to propose that the study be conducted on a more rational and scientific basis. (Suisan Keizai Shimbun, October 18, 1963.)

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MARINE OIL EXPORTS, JANUARY-JUNE 1963 AND FORECAST FOR CALENDAR YEAR 1963:

In the first half of 1963, Japanese exports of edible marine oils were considerably higher than in the same period of 1962 due to much

Japanese Exports of Marine Oils, January-June 1963 and Forecast for Calendar Year 1963 with Comparative Data

| Commodity | January-June | | Calendar Year | |
|---|---|---|---|---|
| | 1963 | 1962 | 1/ 1963 | 1962 |
| | (Metric Tons) | | | |
| Edible Marine Oils: | | | | |
| Cod liver oil | 473 | 244 | 1,200 | 963 |
| Shark liver oil | 10 | 30 | 60 | 110 |
| Fish liver oil | 336 | 542 | 800 | 1,136 |
| Fish oil | 41 | 34 | 940 | 670 |
| Whale oil | 91,935 | 43,474 | 100,600 | 91,439 |
| Total edible marine oils | 92,975 | 44,324 | 103,600 | 94,318 |
| Inedible Marine Oils: | | | | |
| Sperm oil | 7,477 | 2/ | 16,000 | 3/ 13,710 |

1/Forecast.
2/Data not available.
3/Revised.

Japan (Contd.):

larger shipments of whale oil. But for the calendar year 1963, exports of whale oil are expected to show an increase of only 10 percent over the previous year. (United States Embassy, Tokyo, October 3, 1963.)

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## CANNED SALMON PRICES FOR 1963/64 EXPORT YEAR:

The Japanese Canned Salmon Sales Company, on October 14, 1963, announced the establishment of new canned salmon export prices for the October 1963-September 1964 export year. New f.o.b. Japan quotations for canned pink salmon exports are:

| Product | Size | Country of Destination | Price per Case | |
|---|---|---|---|---|
| | | | Shillings/ Pence | US$ |
| Canned Pink Salmon | 48 cans/cs. (8-oz.) fancy | Britain & other Eur. countries | - | 10.30 |
| | | Australia & New Zealand | - | 10.60 |
| | 48 cans/cs. (8-oz.) standard | Britain & other Eur. countries | - | 10.00 |
| | | Australia & New Zealand | - | 10.30 |

Exports of canned pink salmon to countries other than Australia, New Zealand, Britain, and other European countries, are being held at the previous price level, according to Suisan Keizai Shimbun, October 17, 1963.

The new c.i.f. quotations for red and silver salmon are:

| Product | Size | Country of Destination | Price per Case | |
|---|---|---|---|---|
| | | | Shillings/ Pence | US$ |
| Canned Salmon: | | | | |
| Red | 48 cans/cs. (8-oz.) fancy | United States & Canada | - | 19.75 |
| | " " " | Britain | 150 | 21.00 |
| | " " " | Australia | 145 | 20.30 |
| | " " " | New Zealand | 146/3 | 20.48 |
| Red | 96 cans/cs. (4-oz.) | United States & Canada | - | 25.40 |
| | " " " | Britain | 192/6 | 26.95 |
| | " " " | Australia | 186 | 26.04 |
| | " " " | New Zealand | 186/2 | 26.06 |
| Red | 48 cans/cs. (4-oz.) | United States & Canada | - | 12.85 |
| | " " " | Britain | 97/6 | 13.65 |
| | " " " | Australia | 94/3 | 13.20 |
| Silver | 48 cans/cs. (8-oz.) fancy | United States & Canada | - | 13.70 |
| | " " " | Britain | 105 | 14.70 |
| | " " " | Australia | 101/6 | 14.21 |
| | " " " | New Zealand | 102/9 | 14.39 |
| Silver | 96 cans/cs. (4-oz.) | United States & Canada | - | 16.60 |
| | " " " | Britain | 127/6 | 17.85 |
| | " " " | Australia | 123/6 | 17.29 |
| | " " " | New Zealand | 124/9 | 17.47 |
| Silver | 48 cans/cs. (4-oz.) | United States & Canada | - | 8.45 |
| | " " " | Britain | 65 | 9.10 |
| | " " " | Australia | 63 | 8.82 |

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## ANOTHER STERN TRAWLER LAUNCHED FOR ATLANTIC OCEAN FISHERY:

A new 2,150-ton stern trawler (Taiyo Maru No. 75) was launched on October 3, 1963 at Shimonoseki, Japan, for one of Japan's largest fishing companies. A sistership to that vessel, to be called Taiyo Maru No. 76 was scheduled for launching in November. In addition, two larger stern trawlers of the 2,800-ton class are being constructed by that same company. Taiyo Maru Nos. 75 and 76 are scheduled to be dispatched to the Atlantic Ocean trawling grounds off Africa, and the two larger trawlers are destined for the North Atlantic Ocean. (Minato Shimbun, October 4, 1963.)

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## STERN TRAWLER LEAVES FOR FISHING GROUNDS OFF NEWFOUNDLAND:

The large Japanese factoryship stern trawler (the Tenyo Maru No. 3, converted from a tuna mothership) left Yokosuka on October 9, 1963, for the fishing grounds off Newfoundland. The vessel was scheduled to begin fishing late in November and will be "test" fishing various banks off Nova Scotia and Newfoundland for about one year. The Tenyo Maru No. 3 will base at St. Pierre and St. John's, Newfoundland. Plans call for an annual catch of about 14,000 tons of groundfish to yield about 4,500 tons of fillets. (Japanese newspaper, October 10, 1963.)

Note: See Commercial Fisheries Review, July 1963 p. 83.

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## PRESS AND FISHERIES SOCIETY COMMENTS ON NORTH PACIFIC FISHERIES TREATY RENEGOTIATION:

The North Pacific Tripartite Fisheries Treaty (United States, Canada, and Japan) renegotiation meeting, which convened on September 16, 1963, at Tokyo, was adjourned on October 7 and rescheduled for Ottawa, Canada, in the spring of 1964. The Tokyo conference served to clarify any doubts and misunderstandings that may have existed with regard to the national positions of the contracting parties. There was little likelihood that the continuation of that conference would have resulted in a settlement. However, the Japanese Government and the industry had anticipated this earlier, so it came as no surprise.

Japan did not retreat from its original position taken at the Washington, D. C., conference. The United States withdrew its insistence on the maintenance of the abstention principle, and proposed to change the form of the abstention principle to one based on the principle of past fishing record (historical fishing rights).

However, attention once again has been focused on the strong position taken by the United States and Canada, although the position taken by them was not unexpected. Some observers feel that a settlement will not be reached at Ottawa as long as Japan does not make concessions. Some Jap-

## Japan (Contd.):

anese fear that the next meeting may possibly develop into a debate surrounding the United States-proposed historical fishing rights principle. Their views stem from their belief that this proposal has forever denied Japan the opportunity of announcing her intention to abrogate the treaty.

The United States and Canada have no reason to hasten a settlement since the present treaty will continue to be in force if negotiations become extended. As for Japan, she must seek an early settlement so as to prevent the extension of the existing treaty from becoming an established fact.

However, inasmuch as a decision has been made to continue negotiations, Japan cannot announce her intent to abrogate the treaty until after the Ottawa conference. Unless serious problems occur, Japan definitely cannot thoughtlessly proceed to abrogate the existing treaty even after that conference, for the United States, in reprisal, can be expected to proceed to restrict importation of Japanese fishery products.

The Japanese Fisheries Agency claims that the groundwork for settlement at the Ottawa conference has been laid at the Tokyo negotiation, but, depending on circumstances, it is fully conceivable that the Ottawa negotiation will extend over a long period. (Suisan Tsushin, October 7 and 8, 1963, Suisan Keizai Shimbun, October 6 and 8, 1963.)

The following article was written by the Chairman of the Special Committee organized by the Japan Fisheries Society to study Tripartite Treaty (North Pacific Fisheries Convention) problems.

A translation of his article follows:

The second meeting to renegotiate the Japan-United States-Canada Fisheries Treaty was adjourned on October 7, 1963. Some observers view this meeting, since it was held in Tokyo, as a step forward, while others likened it to a "wrestling ring," with the contestants just having made their appearances. However, the question is whether the "ring" set up by Japan and that set up by the United States and Canada are one and the same thing. We must closely examine the quality of the "ring" so that we may have no illusions about it.

The "ring," represented by the "elimination of abstention principle," is made up of dissimilar ingredients, such as "fair and equitable utilization of resources based on the principle of freedom of the high seas," "principle of actual fishing record," and "elimination of newcomers to the fishery." It seems that no matter how much these ingredients are kneaded and pounded, they cannot be combined into a single substance which can be used to build a "ring."

The United States proposed a modification based on the revised treaty drafted by Japan. The United States offered to withdraw the voluntary abstention principle as a term of reference, but insisted on substituting it with the principle of past fishing record, which would amount to maintaining the status existing under the present Treaty.

Canada proposed a revision to the U. S. proposal to the effect that broad cooperation was needed in the field of research and exploration related to certain salmon and herring stocks, and to other fisheries.

The communique issued at the close of the Tokyo meeting stated that the "delegates of the member countries exerted constructive and cooperative efforts in search for a mutually acceptable formula," and that the "meeting contributed materially to narrowing the differences of views that had existed at the end of the Washington meeting." The actual situation is reflected in the statement, "The delegates have arrived at the conclusion that it would be desirable to give further study on means of resolving the differences existing among the three countries," and it may perhaps be over-optimistic to expect a settlement at the next meeting.

The firm determination of the United States to protect her fisheries is revealed in her proposed principle of past fishing record and is also clearly evident in the proposed U. S. legislation (S. 1988) concerning the Continental Shelf. The bill, approved by the U. S. Senate on October 1, is aimed at applying pressure on Japanese and Russian fishing vessels. Moreover, the U. S. Senate, on October 2, passed a 55-percent fishing vessel construction subsidy bill, which reportedly was approved so that the United States could beat Japan and the Soviet Union in the "wet war" (fishery war) in the North Pacific Ocean. We must realize that all these actions indicate the firm determination of the United States to protect her historical rights in the northern waters.

The principle of past fishing record represents, without a doubt, the revival of the Yoshida-Dulles Notes, and is actually an attempt to permanently incorporate in the text of the proposed treaty or its annex the fishing record concept, and it is, therefore, a step backward from the present Treaty. The current concept of international law governing the high seas trends toward respecting the interests of coastal countries, but restraints, such as those which the principle of past fishing record would impose upon newcomers to a fishery, have not been recognized internationally.

It is widely known that the United States and Canada had made desperate efforts at the Geneva Conference to persuade other nations to endorse the abstention principle. The principle of freedom on the high seas, respect for scientific evidence, and exercise of national sovereign rights still have a respectable place in international law.

I think we should appeal to world opinion for support of our view that the principle of past fishing record is unfair. At the same time we should clearly point out the fairness and scientific basis of Japanese assertions, and publicize the fact that Japan has absolutely no intention of detracting from her assertions. Japan's position that the Pacific Ocean resources should be conserved, developed, and utilized fairly and equitably on the basis of scientific findings conforms to the intent of the international law of the sea.

However, in view of the distrust against the Japanese fisheries and undue cautiousness exhibited at the Tokyo meeting by the United States and Canada, Japan must spare no effort in giving positive support to resource conservation and must demonstrate her sincerity by conducting orderly fishing operations. It is important that conservation be emphasized and that the Government, as well as industry, exert greater effort in this direction.

In their comments and editorials, the Japanese dailies Mainichi Shimbun, dated October 6, and the Tokyo Shimbun, dated October 8, urged industry to renew its determination. Those journals severely criticized the wavering attitude manifested by the Japanese Government and industry delegates when they were confronted by the U. S. proposal calling for modification of the Japanese treaty draft. They also expressed strong dissatisfaction at Ito's withdrawal from the negotiation as Japan's chief delegate. I am sure I was not the only one who did some soul-searching as a result of press criticisms that "under those conditions it was impossible to gain public support for revision of the inequitable Treaty."

It is true that industry did not have the opportunity either to assert its position from an industry-wide standpoint or to back up the Government, as well as the delegates who participated in the Treaty talks. I believe this is something the responsible leaders should reflect upon for the future.

In contrast, the United States came forward with very positive actions and countermeasures. Moreover, Senator Bartlett arrived in Japan on October 4 to lend his support to the U. S. team. While his declaration that Bristol Bay salmon possessed U. S. citizenship reflected an attitude unbefitting a great nation, his actions, as well as those of the U. S. delegates, provide a good lesson for our Government and industry leaders.

Japan must face the third conference with renewed determination and greater forcefulness, for that conference definitely will not be an easy one. Therefore, we must

Japan (Contd.):

strengthen our domestic structure with regard to the treaty revision problem, for example by establishing a government-industry group to develop various countermeasures, and by exerting positive efforts to dispel the distrust held by foreign countries against the Japanese fisheries. After carefully reviewing the contents of the Tokyo conference, industry leaders should, as a preliminary step, actively conduct talks with the Japanese Government, as well as with U. S. and Canadian leaders, in an effort to generate public support for the fulfillment of Japan's rightful demands. (Nihon Suisan Shimbun, October 11, 1963.)

* * * * *

INDUSTRY PLANS FOR NORTH PACIFIC FISHERIES COMMISSION MEETING:

The Japanese fishing industry planned on requesting the Fisheries Agency to pursue the following line at the 10th International North Pacific Fisheries Commission (INPFC) Annual Meeting scheduled to be held in Vancouver, B. C., in November 1963: (1) strive for maintenance of the 5,000-ton halibut catch quota in the Bering Sea Triangle Area; (2) press for increasing the number of trawlers allowed to fish in the waters in the eastern North Pacific Ocean to a total of about 10 vessels in 1964; and (3) seek establishment of a program to eliminate sea lions which prey on the fishermen's catch.

At the recent North Pacific Fisheries Convention (Japan, United States, and Canada) renegotiation conference held in Tokyo, a representative of the United States delegation privately expressed the opinion that, in view of declining Bering Sea halibut resources, the United States would seek to have the Triangle Area halibut catch quota reduced to 2,000-3,000 tons. The Japanese industry is said to be very strongly opposed to such a reduction. Lacking complete data for the Triangle Area, the industry is said not to be planning on seeking changes in the existing regulations.

Regarding sea lion predation, the Japanese industry claims that sea lions are causing extensive damages by preying on halibut and sablefish caught on long-line gear. Damage is estimated at about 15 percent of landings. For this reason, they wish to have the INPFC initiate a program to eliminate sea lions. (Suisan Keizai Shimbun, October 17, 1963.)

* * * * *

FISHERIES AGENCY DIRECTOR COMMENTS ON INPFC MEETING:

At a press interview on October 18, the Japanese Fisheries Agency Director, in reference to the 10th International Pacific Fisheries Commission (INPFC) Annual Meeting scheduled for Vancouver, B. C., in November 1963, stated as follows: "The meeting can be construed as an interim meeting before the Tripartite Treaty negotiation takes place in spring 1964. Japan must use prudence in taking part in the November meeting. Therefore, it does not follow that the Government should necessarily conduct negotiations according to industry's wishes. I have my doubts about the soundness of industry's reasoning that, just because the Russians are moving into the waters south of the Alaska Peninsula, Japan must also be permitted to move into those waters. The important thing is that Japan must actively cooperate in resource conservation and endeavor to eliminate the fear harbored by other countries that Japan's fishery is a plundering fishery." (Suisan Keizai Shimbun, October 20, 1963.)

## Republic of Korea

FINANCING OF NEW FISHING VESSELS AIDED BY GOVERNMENT GUARANTEES:

The Government of Korea has guaranteed payment of two fishery loans extended to Korean firms by United States companies. The funds made available are being used to purchase fishing vessels.

One guarantee involves a 5-year loan of $180,000, at 6 percent annual interest, which covers 50 percent of the cost of building three 145-ton tuna vessels in a shipyard in Pusan, Korea. Construction of the vessels was scheduled to begin in mid-October 1963 and be completed within three months. Plans called for those vessels to be dispatched to the southwest Pacific. Their catch would be sold to a United States cannery in American Samoa.

The second guarantee covers a 5-year loan of $620,000, at 6 percent annual interest, which will be used to buy fishing vessels from Japan. In addition, the Korean Government is expected to guarantee a third fishery loan of $1,441,000 which has been offered to a Korean fishery firm by a United States firm in California. The loan would be used to purchase eleven 140-ton tuna vessels from a shipyard in Shikoku, Japan. The vessels would be delivered 6 to 8 months after they were ordered and it is understood that they would fish in the southwest Pacific and market their catch in

Republic of Korea (Contd.):

American Samoa. (United States Embassy, Seoul, Oct. 4, 1963.)

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ITALIAN-FRENCH CONTRACT TO BUILD FISHING VESSELS HELD UP:

Officials of the Korean Government state that the Italian-French consortium holding a contract to build a large number of fishing vessels and equipment has rejected the Korean proposal for a "stand-by" letter of credit. In their view this proposal would constitute a basic change in the terms of the contract which they cannot accept.

The Korean Cabinet decision on the payment of US$4.4 million (8 percent of the $55 million as the first portion of the agreement) is reportedly further delayed. The Cabinet hopes that the consortium might still agree to Korea's proposed "stand-by" letter of credit, which includes an arrangement whereby annual payment is conditioned upon the catch of a given year, i.e., the proposed "stand-by" letter of credit would allow Korea to reduce payment in a year of poor catch or partially defer payment to subsequent years. (United States Embassy, Seoul, October 18, 1963.)

## Mexico

MARKET FOR CANNED SARDINES RESTRICTED TO DOMESTIC PRODUCTION:

Mexican trade and Government sources report that no canned sardines have been imported into Mexico since March 1963 because import permits are no longer being granted by the Mexican Government.

Restrictions on sardine imports are in line with Mexico's traditional policy of not granting permits for the importation of commodities of types produced in Mexico or for which Mexican-made products can be substituted. The Mexican sardine industry is increasing its production, and trade sources think it is not likely that imports of canned sardines will be permitted in the near future.

Imports of canned sardines in the first three months of 1963 totaled 4,087 legal kilograms valued at US$1,820, nearly all imported from Spain. The imports entered Mexico under import permits issued in 1962.

Under the circumstances, Mexico cannot be regarded as a good potential market for exports of United States canned sardines and other small canned fish. (United States Embassy, Mexico, October 2, 1963.)

* * * * *

DROP IN UNITED STATES SHRIMP PRICES FORCES VESSEL OWNERS TO SEEK RELIEF:

The contract between Mexican fishing cooperatives and vessel owners on the Pacific Coast, concluded in September 1962, provided that the cooperative fishermen would receive 45 percent of the sales value of the shrimp and the vessel owners 55 percent. The contract stipulated that the vessel owners would pay all operating and maintenance costs of the vessels.

After the end of the closed season, which extends from July 15 to September 15, the 1963/64 shrimp season opened with a disagreement between the Pacific Coast fishing cooperatives and the private vessel owners over which should pay vessel repair and maintenance costs.

When United States shrimp prices began declining in June of this year, the vessel owners reportedly petitioned the Secretariat of Industry and Commerce to grant them some relief by amending the contract to provide that vessel fueling costs be borne by the cooperative fishermen. In July, when it became evident that the request would not be granted, the vessel owners alleged that because of declining prices they would not be financially able to pay for vessel repair costs. The cooperatives, on the other hand, declared that the vessel owners must comply with the provisions of the contract, which is valid until August 31, 1965. Moreover, they pointed out that the vessel owners had not presented a cost analysis which would in any way justify a revision of the contract.

For a time it appeared that the start of fishing operations would be delayed until a settlement could be reached. However, vessel owners had the vessels ready to go out when the season opened, and shrimp fishing continued uninterruptedly through October.

The National Chamber of the Fishing Industry, which represents the vessel owners, states that it has not received official notification from the Secretariat of Industry and Commerce as to whether or not the contract will be revised. However, an under secretary of the Secretariat made a public statement in the State of Chihuahua at the end of September to the effect that the contract would not be revised. Sources in the trade are of the opinion that the contract will not be revised during the present season.

There has been no contractual disagreement in the Gulf of Mexico. Shrimp contracts in that area were agreed upon in September 1962 and extend until August 31, 1964. The major problem there has been the drop in United States shrimp prices as the United States is virtually the sole market for Mexican shrimp.

The price drop has created difficulties in the State of Campeche, where an estimated 14 percent of the State's population depends on the shrimp industry. In an effort to find ways of alleviating the problem without having to cease fishing operations, which the vessel owners asserted were uneconomical under the circumstances, the latter held several conferences with the Governor in mid-October. The vessel owners declared that when prices are good, profits are distributed equitably among the vessel owners, the fish-

Mexico (Contd.):

ermen, and affiliated industries, but that when prices are so depressed as to cause losses, the vessel owners must bear the major part of such losses. They appealed to other participants in the shrimp industry to share part of the losses being incurred during the current season.

As a result of those discussions, the Governor announced on October 19, that he had successfully persuaded ice factory owners to agree to lower their prices from US$6.40 to $4.80 per ton of ice for a period of three months. At the same time, the Union of Loaders and Unloaders agreed to reduce their tariffs by 50 percent. The Governor also indicated that he would endeavor to obtain a reduction in the Federal shrimp export duties and offered to petition the Federal Government, on behalf of the vessel owners, for a reduction of 0.10 pesos (0.8 U.S. cents) per liter in the price of Diesel oil as a temporary subsidy while the price problem lasts.

On the Pacific Coast, efforts are being made to open up markets for Mexican shrimp in Europe. In mid-October, a press announcement indicated that an order for Mazatlan shrimp had been received from Britain and that the first shipments would be made in November of this year. The report stated that the creation of new markets would alleviate the present problem created by the drop in United States shrimp prices and in the future will afford some protection to the Mexican shrimp industry from the dangerous policy of depending on the United States market exclusively. (United States Embassy, Mexico, October 24, 1963.)

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PRICES FOR BAJA CALIFORNIA'S SPINY LOBSTER EXPORTS RENEGOTIATED:

The official spiny lobster fishing season in Baja California, Mexico, opened on October 1, 1963, and will continue through March 15, 1964. Landings of spiny lobsters during each of the past two seasons have exceeded 1.5 million pounds (United States Consulate, Tijuana, October 15, 1963.)

Because of an alleged market saturation in the United States due to spiny lobster imports from other countries, it is reported that the United States company, which in 1962 signed a 3-year contract for the purchase of the entire exports from the Baja California peninsula with automatic price increases each year, would be unable to meet the contract prices and has renegotiated the 1963/64 season purchase prices as follows:

Young lobster (medida)--US$0.55 per pound or 7.5 U.S. cents per pound less than paid in 1962; old and large lobster (burro)--$0.45 per pound or 3 cents per pound less than last year; and tails (colas)--$1.05 per pound or an increase of 5 cents per pound over 1962.

## Netherlands

AIR PUMP DEVELOPED FOR UNLOADING FISH FROM VESSELS:

A new type pneumatically-operated fish discharger recently developed in Holland is designed to unload between 20 and 80 tons of fish an hour. This fully-automatic installation features not only a high rate of unloading, but also little or no damage to the fish.

View of air pump for unloading fish from vessels.

Without being immersed in water, the fish are sucked up from the hold in a powerful air stream moving at a constant speed of between 49 and 82 feet a second. As they enter the suction mouth and line, the fish pass on to a collector where they are separated from the air. By means of an automatic air lock, they are then discharged in quantities of about 220 pounds every 5-11 seconds.

An air pump driven by a Diesel or electric motor regulates the strength of the air stream in the suction pipe and keeps it constant. When the pump's motor is started, the installation begins functioning. The mouth of the suction pipe is then placed among the fish. This can

Netherlands (Contd.):

be done either manually or mechanically. From then on, the entire operation is automated.

While the fish are traveling through the suction line, they are surrounded by air and thus barely touch the pipe walls. Special guide boards attached to the collector's outlet also minimize damage to the fish.

Depending on the type of fish and the distance conveyed, the discharger's capacity averages 2 hp. per ton an hour. Two models are manufactured, one to accommodate hourly workloads of between 20 and 40 tons, and the other between 40 and 80 tons an hour. Both models have built-in safeguard against faulty operation and breakdowns. The discharger can be cleaned easily by rinsing it with a built-in flushing line which sprays water at a number of points.

The entire installation or only the exhauster and collector parts are available for sale and export. If only the two vital parts are purchased, the manufacturer will provide the necessary advice for construction and assembly of the structure.

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MARINE ANIMAL OILS SUPPLY AND DISPOSITION FOR YEAR ENDING JUNE 30, 1963:

For the year ending June 30, 1963, total distribution of marine animal oils in the Netherlands amounted to 76,000 metric tons.

Netherlands Marine Animal Oil Supply and Distribution, July 1, 1963

| Item | | Quantity |
|---|---|---|
| | | Metric Tons |
| Supply: | | |
| Opening stocks | July 1, 1962 | 44,000 |
| Imports | July-June 1962/63 | 49,000 |
| Production | " " " | 20,000 |
| Total supply | " " " | 113,000 |
| Disposition: | | |
| Exports | " " " | 2,000 |
| As food | " " " | 70,000 |
| Other uses | " " " | 4,000 |
| Total distribution | " " " | 76,000 |
| Closing stocks | July 1, 1963 | 37,000 |

The available supply totaled 113,000 tons. (U. S. Foreign Agricultural Service Report, The Hague, October 22, 1963.)

Note: See Commercial Fisheries Review, September 1961 p. 95.

## New Zealand

FISH AND SHELLFISH LANDINGS, 1962:

In 1962, New Zealand's fisheries landings amounted to about 55.5 million pounds of finfish valued at about US$5 million. Shellfish landings included about 9 million pounds of live spiny lobsters valued at close to $3 million and 107,268 sacks of other shellfish valued at about $550,000. Nine finfish varieties made up about 87 percent of the quantity and 83 percent of the value of the total 1962 finfish landings. The fishery for spiny lobster was by far the most valuable to the New Zealand fishermen. (Commercial Fisheries, September 1963.)

New Zealand's Landing of Fish and Shellfish, 1962

| Species | Quantity | Value | |
|---|---|---|---|
| | 1,000 Lbs. | NZ£ | US$ 1,000 |
| Finfish: | | | |
| Blue cod | 2,622 | 118,039 | 331 |
| Elephant fish | 2,277 | 122,250 | 342 |
| Gurnard | 5,292 | 95,116 | 266 |
| Grouper (Hapuku) | 2,309 | 154,557 | 433 |
| Pioke | 1,294 | 43,220 | 121 |
| Snapper | 15,997 | 432,140 | 1,210 |
| Sole | 1,149 | 90,854 | 254 |
| Tarakihi | 12,366 | 354,710 | 993 |
| Trumpeter | 4,930 | 61,090 | 171 |
| Other | 7,229 | 300,652 | 842 |
| Total finfish | 55,465 | 1,772,628 | 4,963 |
| Shellfish: | | | |
| Spiny lobsters (1,000 lbs.) 1/ | 9,002 | 1,070,888 | 2,998 |
| Other shellfish (sacks) 2/ | 107,268 | 196,252 | 550 |
| Total shellfish | - | 1,267,140 | 3,548 |

1/Live weight.
2/Includes 72,218 sacks of oysters and 35,050 sacks of mussels and scallops.

## Norway

FISH CANNING INDUSTRY:

Among the leading exports from Norway is canned fish which goes to markets throughout the world. In 1962, shipments amounted to 31,000 metric tons worth 156 million kroner (US$21 million). Main markets are in the United States, United Kingdom, Australia, and Canada.

Leaders among Norway's canned fish exports are sild (small sea herring) and brisling sardines in oil and tomato, accounting for about two-thirds of the total canned fish exports.

Also important are herring kippers, mackerel, roes, shrimp, and various delicatessen

Norway (Contd.):

items such as herring tidbits, and Norwegian specialities such as fishballs and fish pudding.

The method of preserving foods in hermetically sealed containers was introduced in Norway as long ago as 1841, but it was in 1879 when experiments in Stavanger led to the successful preservation of smoked brisling in olive oil, that the foundations for Norway's modern fish-canning industry were laid. Not long after, small herring (sild) were successfully canned as sardines, employing the same method as for brisling.

Norwegian brisling and sild sardines quickly became popular abroad. Norway's canned fish exports climbed sharply, from 2,000 tons in 1900 to 9,000 tons in 1908, to 21,000 tons in 1911, and to a record 52,000 tons in 1915.

That early boom saw a rapid increase in canning companies and plants with a combined capacity far in excess of raw material supplies or marketing possibilities.

Recent years have seen a big reduction in the number of companies and plants. The trend is towards larger units, increased specialization, and more sales cooperation.

In 1950 there were 81 companies with 149 plants producing brisling. In 1963 there were 38 companies with 65 plants producing brisling. The trend has been the same for sild sardines and kippered herring. At the same time there has been technical rationalization and mechanization on an increasing scale.

High and consistent quality has long been a factor determining the success of Norwegian canned fish on world markets. Stringent regulations and standards are enforced by law and conscientiously upheld by the industry itself in the knowledge that a reputation for quality is the best advertisement and must be strictly guarded.

The Research Laboratory of the Norwegian Canning Industry, established more than a quarter of a century ago, the Official Norwegian Quality Control Institute for Canned Fish Products, established by law in 1953, and the Norwegian Canning School, all centered in Stavanger, are a powerful group of institutions testifying to the Norwegian canning industry's determination to produce the best in canned fish for world markets.

The largest concern in the Norwegian fish canning industry is located in Stavanger. This 80-year old company is the biggest canned fish producer in Scandinavia and accounts for about a third of Norway's total production and export of canned fish. The output exceeds 50 million cans a year.

In the last few years the company has invested about 15 million kroner (US$2.1 million) in an extensive modernization program. In Stavanger a new central factory is now in operation with a capacity exceeding the output of the five plants which the firm previously operated in that city.

The raw material store can hold several hundred tons of fish at a time and features a deep freeze with a capacity of 24 tons per 24 hours with a freezing temperature of 30 degrees below zero. Storing of fish in deep freeze is a new procedure in the canning industry and means that production can be carried on continuously throughout the whole year instead of on an irregular seasonal basis.

With continuous production, labor will be easier to get, and at the same time the total labor force can be reduced. Previously, this firm employed as many as 3,000 workers at peak times. Now it employs about 1,250 workers, mostly on an all-year-round basis.

In addition to the new central plant in Stavanger, the company operates 9 plants elsewhere in Norway. The company has its own sales offices in the United States, Canada, and Australia. The United States is the principal market, and particularly well established on this market are the company's brisling sardines which have been sold here for more than half a century. (Norway Exports, March 1963.)

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MARKETING GROUP SETS RECORD FOR FROZEN FISH EXPORTS IN YEAR ENDING JUNE 1963:

Norway's cooperative marketing organization for frozen fish products achieved record turnover and record exports in the fiscal year ending June 1963. Total sales were about 45,000 tons and exports were 42,000 tons--8,000 tons more than in the preceding fiscal year. The biggest item was fillets at some

Norway (Contd.):

35,000 tons compared with 27,000 tons the preceding year.

The markets are principally in the United States and West Europe. Exports to the United States increased last year by no less than 50 percent, from 6,000 to 12,000 tons. The United Kingdom, West Germany, Italy, France, Sweden, Finland, Australia, and Israel, are the other principal customers. Sales in the 1962 fiscal year were worth about 175 million kroner (about US$25 million).

The cooperative marketing organization was established in 1946 and is the marketing organization for more than 90 freezing plants which are members. The plants are located at strategic points along the Norwegian coast, particularly in the north, close to the fishing grounds.

The quality of the frozen fish is preserved at all stages from capture to retail outlet through a meticulously planned and stringent system of control of raw material, processing, storage, and transport. The organization's research and testing departments have been developed and expanded and work closely with a team of inspectors appointed by the Norwegian State Fresh Fish Supervisory Board. In conformity with regulations laid down by the Norwegian Directorate of Fisheries, highly qualified experts ensure that only top quality material is processed. (Norway Exports, March 1963.)

## Panama

SPINY LOBSTER EXPLORATORY FISHING PROJECT CONTINUED:

M/V "Pelican" Cruise 15 (September 5-27, 1963): The survey of stocks of spiny lobsters off Panama by the chartered commercial fishing vessel Pelican was continued in September 1963 when simulated commercial lobster fishing was conducted in the northwest section of the Bay of Panama. The survey is being conducted by the U. S. Bureau of Commercial Fisheries through an interagency agreement with the U. S. Agency for International Development (AID) Mission to Panama as an Alliance for Progress program.

M/V Pelican, commercial fishing vessel under charter to U. S. Bureau of Commercial Fisheries for exploratory work off Panama.

The total catch during the cruise was 1,066 lobsters weighing 1,458 pounds. The catch consisted of 970 (1,374 pounds) spiny lobsters (Panulirus gracilis) and 96 (84 pounds) rock lobsters (Scyllarides species). Of those, 25 spiny and 95 rock lobsters were caught in trawls during bait-fishing operations. The rest of the catch was made with Florida-type wood slat traps.

Fishing operations were designed to approximate as close as possible a 1-boat 2-man operation using a string of 200 traps. The traps (90 percent of which were new) were distributed in selected areas and 100 were hauled and reset each day. The catch was light with the new traps for the first few days, but gradually increased until about 100 pounds of lobsters per day were being caught. The 100-pound-per-day average continued until strong southeast winds developed with a change in the weather. During this period, the catch in traps in open and exposed areas dropped drastically. Traps protected by several small islands continued to produce at the previous catch rate. After the wind calmed, the catch rates of the exposed traps gradually increased over a period of a week until production again reached 100 pounds per day.

Two experimental molded polyethylene plastic traps were used without success. One of the traps was severely damaged by sharks.

During bait trawling, 1 tow produced 4 bushels of scallops (Pecten species) from a depth of 10 fathoms. The meats were of commercial size and the yield averaged 7-8 pints per bushel.

Note: See Commercial Fisheries Review, August 1963 p. 102.

## Philippine Republic

CANNED SARDINE BIDS CANCELLED:

Bids for the award of 500,000 cases of sardines by the Philippine National Marketing Corporation (NAMARCO) were opened on September 23, 1963. NAMARCO announced, however, that no award was made, since the country of origin of the sardines offered could not be identified (the conditions of the tender specified that South African products would not be accepted). Instead, NAMARCO has issued a tender for mackerel and sauries. (United States Embassy, Manila, October 28, 1963.)

## Poland

FISHERIES TRENDS, JULY 1963:

Good herring catches were taken by the Polish fleet of over 100 trawlers and 50 cutters which operated in the North Sea in July 1963. The Deputy Director of the Polish Association of the Fish Economy reported that for the first time in many years herring schools were found in both shallow and deep water in the North Sea. Some lugger trawlers based in Szczecin caught 15-24 metric tons daily in July.

Polish cutters in the Baltic Sea also had a good season in the summer of 1963, although July and August are usually slack periods.

Four Polish trawlers which operated in the North Atlantic off the coast of Labrador in the summer of 1963, reported an average catch in July of 42 tons per day. (Trybuna Ludu, Warsaw, July 27, 1963.)

## Portugal

CANNED FISH EXPORTS, JANUARY-JUNE 1963:

Portugal's total exports of canned fish during the first half of 1963 were down 3.3 percent from those in the same period of 1962, due primarily to lower exports of sardines (down 8.0 percent) and anchovy fillets (down 16.9 percent). The decline was offset partly by a considerable increase in exports of mackerel. Sardines accounted for 78.7 percent of the 1963 exports of canned fish, followed by anchovy fillets with 9.0 percent, and mackerel with 7.4 percent.

Portuguese Canned Fish Exports, January-June 1962-1963

| Product | January-June | | | |
|---|---|---|---|---|
| | 1963 | | 1962 | |
| | Metric Tons | 1,000 Cases | Metric Tons | 1,000 Cases |
| In Oil or Sauce: | | | | |
| Sardines | 23,103 | 1,216 | 25,102 | 1,321 |
| Chinchards | 570 | 30 | 719 | 37 |
| Mackerel | 2,170 | 86 | 614 | 24 |
| Tuna and tuna-like | 1,003 | 33 | 1,125 | 37 |
| Anchovy fillets | 2,338 | 233 | 2,813 | 281 |
| Others | 162 | 8 | 131 | 7 |
| Total | 29,346 | 1,606 | 30,504 | 1,707 |

Portugal's principal canned fish buyers during the first half of 1963 were Germany with 4,778 metric tons, followed by Italy with 3,825 tons, United Kingdom 3,587 tons, the United States 3,380 tons, France 2,585 tons, and Belgium-Luxembourg 2,256 tons. (Conservas de Peixe, August 1963.)

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CANNED FISH PACK, JANUARY-JUNE 1963:

Portugal's total pack of canned fish in oil or sauce for the first half of 1963 was down about 43 percent as compared with the same period in 1962. The decline was due to a sharp drop in the pack of sardines as well as a smaller pack of chinchards and anchovy fillets. During February and March 1963, a closed season for sardine fishing was in effect. Portuguese sardine landings during January-June 1963 totaled 30,262 metric tons, compared with 78,737 tons in the same period of 1962. (Conservas de Peixe, August 1963.)

Portuguese Canned Fish Pack, January-June 1962-1963

| Product | January-June | | | |
|---|---|---|---|---|
| | 1963 | | 1962 | |
| | Metric Tons | 1,000 Cases | Metric Tons | 1,000 Cases |
| In Oil or Sauce: | | | | |
| Sardines | 4,576 | 241 | 10,746 | 565 |
| Chinchards | 30 | 1 | 1,289 | 68 |
| Mackerel | 952 | 37 | 188 | 7 |
| Tuna and tuna-like | 1,943 | 64 | 1,466 | 49 |
| Anchovy fillets | 2,069 | 206 | 3,081 | 368 |
| Others | 85 | 4 | 108 | 5 |
| Total | 9,655 | 553 | 16,878 | 1,062 |

## Somali Republic

TUNA CANNERY TO BE BUILT WITH SOVIET AID:

A tuna cannery is to be built in the northern part of the Somali Republic with Soviet technical assistance and credit. Material, erection machinery, and transport equipment were being supplied by the Soviet Union. Located in the Las Khoreh zone of Somalia, the new plant will have an estimated seasonal production capacity of 2,100 metric tons of canned fish (calculated on the basis of single-shift operation). Plans for the new operation call for the installation of fish reduction equipment with a capacity of 15 tons per day, a fish freezer with a capacity of 20 tons per day, and cold-storage facilities for 800 tons of frozen products. (United States Embassy, Mogadiscio, October 14, 1963.)

## South Africa Republic

PILCHARD-MAASBANKER FISHERY, LANDINGS AND PRODUCTION, 1959-63:

Improved landings in the final stages of the Republic of South Africa's Cape west coast pelagic shoal fishing season helped to offset the disappointing early months when results were far below those for the January-March periods in 1961 and 1962.

Landings for the 7-month season were 441,943 short tons of pilchards, 12,827 tons of maasbanker, and 14,634 tons of mackerel. To fishermen and factories who had just enjoyed two remarkably good years, the 1963 landings of 469,404 tons were down as compared with the 545,569 tons landed in 1962 and the 542,429 tons landed in 1961.

However, the 1963 landings were the third highest taken by the Cape west coast fleet. With Walvis Bay factories permitted to process 540,000 tons of pilchards in 1963, the combined South and South-West African shoal fishing catch may exceed the 1962 record of more than 980,000 tons.

A feature of the Cape fishing season was the wide distribution of the fish schools. Fish were taken over most of the now extended operating area, but the best catches were north of Cape Town. This was to the advantage of factories from Saldanha Bay to Lambert's Bay.

Catch and production figures for the Cape west coast over the five year period 1959 to 1963 are shown in table.

Although the pilchard landings in 1963, were higher than those of any year except 1962 and 1963, those for maasbanker dropped sharply from the 69,432 tons landed in 1962 and the 1963 total of only 12,827 tons was the lowest since the Cape west coast shoal fishery began in 1946/47. The mackerel landings also fell off sharply and the 1963 total of 14,634 tons was the lowest since 1957. Both the maasbanker and the mackerel landings can still, however, be improved if a substantial effort is made in the November and December short season when these two species of fish may be caught. (The South African Shipping News and Fishing Industry Review, September 1963.)

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PILCHARD-MAASBANKER FISHERY, JULY 1963:

According to figures released by the Division of Sea Fisheries, the July 1963 catch was 64,726 tons of pilchards and 35 tons maasbanker. This compares with 42,341 tons pilchards, 6,176 tons maasbanker, and 3,010 tons mackerel in July 1962; and with 56,503 tons pilchards, 301 tons maasbanker, and 11,703 tons mackerel in July 1961.

The July 1963 catch yielded 15,285 short tons fish meal, 412,616 imperial gallons fish body oil, and 2,674,128 pounds of canned pilchards. (The South African Shipping News and Fishing Industry Review, September 1963.)

South Africa's Cape West Coast Pelagic Shoal Fish Landings and Production, 1959-1963

| Year | Total Landings | Fish Meal | Fish Body Oil | Canned Fish | | | |
|---|---|---|---|---|---|---|---|
| | | | | Pilchard | Maasbanker | Mackerel | Total |
| | (Short Tons) | | 1,000 Gals. | (1,000 Lbs.) | | | |
| 1963 | 469,404 | 108,743 | 6,693 | 16,891 | 776 | 3,339 | 21,006 |
| 1962 | 545,569 | 124,698 | 8,295 | 14,688 | 18,132 | 7,894 | 40,714 |
| 1961 | 542,429 | 119,388 | 9,725 | 20,732 | 10,715 | 11,780 | 43,227 |
| 1960 | 423,524 | 90,204 | 6,080 | 5,997 | 15,912 | 8,075 | 29,984 |
| 1959 | 342,776 | 71,505 | 3,592 | 925 | 6,923 | 12,781 | 20,629 |

## South-West Africa

FISHERIES TRENDS, JULY 1963:

During the month of July, 17,235 tons of fish meal were shipped from Walvis Bay, South-West Africa. The shipments were consigned mainly to East Germany. In August another 9,000 tons were due to be shipped and a near record shipment of 25,000 tons was due to be shipped in September.

All the available fish oil will be shipped to the United Kingdom in November aboard the tanker Anella.

Although the quality of the pilchards improved in late July and early August, with the yield increasing to over 10 gallons per ton of raw fish, the fish reduction plants were well behind the anticipated fish-oil production for the year.

Pilchard landings at Walvis Bay in South-West Africa in June amounted to 79,477 short tons and in July this year to 75,338 tons. Landings at Walvis Bay during January-July 1963 totaled 350,119 tons. (The South African Shipping News and Fishing Industry Review, September 1963.)

## Taiwan

NEW FISHING VESSELS TO BE FINANCED BY WORLD BANK LOAN:

Announcement of the signing on September 27, 1963, of an agreement by the International Bank for Reconstruction and Development and the Taiwan Government calling for a US$7.8 million loan to finance the construction of 16 large fishing vessels was well received by the Taiwan press.

According to present plans the World Bank loan, which is the first to be made to Taiwan, will meet the foreign exchange costs of constructing thirteen 300-ton vessels and three 1,000-ton vessels. The loan is for a term of 15 years at 5.5 percent interest. Sub-loans will be made by the Land Bank of Taiwan at 7 percent.

The loan was approved in principle some months ago but signing was delayed in order to permit the Government to find suitable fishing companies willing to apply for the new vessels and able to finance them. This has now been accomplished, but a number of the recipients are newly-organized companies having no previous experience in this line of business. (United States Embassy, Taipei, October 11, 1963.)

## Thailand

FISHERIES LANDINGS INCREASE:

The total estimated fisheries catch in Thailand from all sources in 1962 was 13 percent above that of the previous year. Fish is one of the main supplements to the people's rice diet and there is a large catch by anglers for their own direct consumption.

Thailand Fisheries Catch, 1960-1962

| Year | Commercial | | Non-Commercial 1/ |
|---|---|---|---|
| | Marine Fish | Fresh Water Fish | |
| | (1,000 Metric Tons) | | |
| 1962 | 1/250 | 1/100 | 1/350 |
| 1961 | 233 | 72 | 305 |
| 1960 | 146 | 73 | 219 |

1/Estimated.

The Government of Thailand distributes carp fingerlings and other kinds of fresh water fish to stock inland ponds and streams. A growing practice around Bangkok is to combine fish production with the raising of poultry or swine in pens built over water.

Thailand's imports of fishery products have been limited to 5 to 10 metric tons annually. (United States Embassy, Bangkok, September 23, 1963.)

Note: See Commercial Fisheries Review, March 1963 p. 83; July 1961 p. 92.

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FISHERIES SURVEYED FOR POTENTIAL INVESTMENT BY UNITED STATES FIRM:

A divisional sales manager of one of the large California tuna canning firms is undertaking a survey to determine the feasibility of a large-scale fishing, freezing, canning, and marketing operation in Thailand. The expenses of the trip are being shared by the U. S. Agency for International Development (AID) under its investment survey program.

The California firm's representative in reviewing the investment possibilities in Thailand's fishing industry commented as follows:

(1) The California firm apparently has adequate research data available to meet its needs regarding oceanography and the presence of abundant marine life in the Gulf of Thailand, the Indian Ocean, and the Andaman Sea.

(2) The representative stated, however, that he is concerned that the fish in the Gulf of Thailand may be relatively isolated in the Gulf and not be a part of large movements of fish from outer waters. Should this be the case, he said

Thailand (Contd.):

that there might not be a sufficient quantity of fish in the Gulf to support a large-scale fishing operation.

(3) He mentioned also his concern about the present requirement that all fish for local consumption must pass through the market before processing, packing, or retailing. Unless the Thailand Government were to agree to some remedial procedure, this would mean that the large processer would have to purchase his own catch through the market prior to freezing, canning, etc. This point would have to be clarified in connection with any application to the Board of Investment for promotional privileges.

(4) It is contemplated that an economic fishing and processing operation, of the scale that would interest the California firm, would include the use of fishing fleets both in the Gulf and in the waters west of southern Thailand.

(5) In order to determine the domestic market potential, and the role this market will play in the total sales program, the representative is commencing his survey with a study of wholesale and retail fish distribution in Thailand and the public's fish eating habits.

(6) He feels that because of the increasing world demand for fish products and the fact that several large markets in the Far East, particularly the Philippines, are looking for new sources of supply, there appears to be an excellent opportunity for the establishment of a regional supply point. He hopes this survey will prove the feasibility of setting up such a supply point in Thailand.

(7) It is anticipated that the survey will take from 6 to 8 weeks. (United States Embassy, Bangkok, October 21, 1963.)

## U.S.S.R.

FISHERIES TRENDS IN NORTHWEST ATLANTIC, OCTOBER 1963:

In October 1963, the Soviet fishing fleet on Georges Bank in the Northwest Atlantic was sharply reduced from a high of about 300 vessels engaged in taking herring and whiting in August and September 1963. The fleet began leaving Georges Bank early in October, about six weeks ahead of the scheduled departure date. Shortly after the middle of that month, only 16 vessels (11 stern trawlers and 5 support ships) were observed in the area south of Nova Scotia, Canada. Those vessels were located adjacent to Browns Bank. One or two Soviet vessels were seen at various times in late October on Georges Bank, but they were probably research vessels searching for concentrations of herring.

During the summer of 1963, representatives of the U. S. Bureau of Commercial Fisheries boarded five Soviet trawlers which were towed into Cape Cod Bay (Mass.) for repairs. The vessels had been away from their home port on the Baltic Sea for periods varying from 3 to 6 months. Each of the vessels boarded reported having taken only herring and whiting. The otter-trawl nets used by the vessels in 1963 were designed to fish off the bottom as they were not equipped with rollers or heavy sweep ropes. The synthetic cod ends had meshes of approximately $4\frac{1}{4}$ inches and a liner with meshes measuring about $1\frac{1}{8}$ inches.

During 1962, the Soviet trawlers fishing on Georges Bank were equipped with gill nets instead of otter trawls. The gill nets caused U. S. fishing vessels considerable difficulty because of their length and because pieces of gill net would frequently break away from the main net. At least 15 U. S. fishing vessels were disabled in 1962 by gill nets which fouled their propellors. Only 2 or 3 vessels suffered similar damage in 1963.

The herring caught by the Soviet trawlers were salted down whole in barrels by a special machine carried on the deck of the fishing vessels. The machine had an endless bucket belt which lifted the herring up to a point above the barrel which was on a vibrating platform. Salt from a hopper on the side was introduced as herring fell into the barrel. The vibrating platform assured a solidly filled barrel and a good mixing of salt and fish. Filled barrels were stowed in the hold and on deck, while awaiting transfer to a fish transport. Depending upon the weather and sea conditions, the trawlers would go alongside about every 3 days or when they had about 6 tons of fish to transfer. They received, in return, empty barrels, fuel, food, and water.

During June-September 1963, the period of greatest activity, the Soviet fleet appeared to be fishing a great deal harder than in past years. The stern trawlers were seldom seen at anchor, and the side trawlers appeared to be fishing most of the time. The smoke issuing from the stern trawlers indicated that greater quantities of fish meal were produced in 1963 than before, and the number of fish transports present seemed to indicate a larger over-all catch of fish.

Note: See Commercial Fisheries Review, November 1963 p. 84. Also see "Foreign Fisheries Briefs," p. 84 of this issue.

## United Arab Republic

FISHING INDUSTRY STATUS IN 1962 AND OUTLOOK FOR 1963:

Fishermen in the United Arab Republic (U.A.R.), landed an estimated 118,000 to

United Arab Republic (Contd.):

140,000 metric tons of fish in 1962, a considerable increase over the estimated 1961 catch of 110,000 tons. The 1962 catch was valued at up to ŁE 16.8 million (US$38.6 million) as compared to ŁE 11.0 million ($25.3 million) in the previous year. Estimated frozen shrimp production in 1962 reached an all-time high of 1,466 tons, valued at an estimated ŁE 870,000 ($2.0 million). Estimated 1961 shrimp production was 955 tons valued at ŁE 454,000 ($1.0 million). Sales of frozen shrimp to the United States are declining but sales to European and Japanese markets are mounting. Export and domestic shrimp prices rose about 10 percent in 1963, with Japan paying the highest prices for top quality shrimp. With expanding market possibilities, frozen shrimp processing capacity in the U.A.R. is being increased. Other new developments include a fish meal and shark liver oil plant which opened at Ghardaka on the Red Sea in 1963.

U. A. R. fishery exports totaled 2,085 tons in 1962 valued at ŁE 762,000 ($1.8 million), an increase of 9 percent over 1961, when exports amounted to 1,913 tons valued at ŁE 564,000 ($1.3 million). Imports, on the other hand, totaled 1,409 tons in 1962, valued at ŁE 88,000 ($202,000), a sharp drop from 1961, when imports totaled 7,599 tons valued at ŁE 918,972 ($2.1 million). Imports in 1963 were running behind 1962, while exports may exceed those in 1962. Domestic consumption of fish in the U.A.R. in 1962 was between 117,000 and 139,000 tons or about 5.2 kilograms (11.5 pounds) of fish per capita.

The U. A. R. fishing fleet is now estimated at 12,685 vessels of which only 663 are motorized. New vessels are being built in local shipyards or purchased abroad, and Diesel motors are being installed in many vessels in the existing sailing fleet.

There are an estimated 70,581 licensed fishermen (including 14,000 apprentices) in the U. A. R. and up to 230,000 workers employed in allied industries. Fishing employment, therefore, represents about 5 percent of the total U.A.R. labor force of a little more than 6 million.

Although fish marketing is still generally in the hands of private fish brokers and handlers, the trend is toward cooperative marketing in accordance with stated national policy. Fish is presently marketed cooperatively in Port Said and Suez and mainly through traditional channels in all other U. A. R. ports.

Fisheries research is being actively pursued under the Ministry of Scientific Research, which is negotiating to buy a new 300-ton research vessel to be used for exploratory and experimental fishing in coastal waters. Progress was also reported in the Ministry's fish farms, breeding stations, and lake research laboratories in 1962. Nile River research is being carried out between Aswan and the Sudanese frontier to determine the types of fish and conditions for fish life that may be found in the new Lake Nasr that will form behind the Aswan High Dam by 1968.

The General Organization for Aquatic Resources, Ministry of Supply, is the Government's principal instrument for developing the country's fisheries. That Agency is operating in fiscal year 1963/1964 on a budget of ŁE 3.8 million ($8.7 million) compared to a budget of ŁE 1.8 million ($4.3 million) in 1962/1963. New fishing ports are planned in Alexandria and Damietta and improvements were being made at Mersa Matruh. Fishing harbors are planned for the Red Sea ports of El Arish, Ghardaka (Hurghada), Safaga, Ras Banas, Berenice, and Quseir. The inland lakes policy dispute--whether to dry up the inland lakes for use as reclaimed farm land or continue utilizing them as inland fisheries--was still unsettled in the fall of 1963.

Active international fishing agreements are in force between the U. A. R. and Greece and Holland and new agreements were being negotiated with Japan and Russia. Former agreements with Italy, Yugoslavia, and Poland are dormant. Fishing collaboration with Somalia, Yemen, Kuwait, and the Sudan is planned, but no firm arrangements had been concluded by the latter part of 1963. (United States Consulate, Alexandria, October 25, 1963.)

## United Kingdom

PRODUCTION OF FISH FLOUR AROUSES INTEREST:

Inquiries from about 20 British manufacturers interested in incorporating the new high-protein fish flour in their food products have been received by an Aberdeen manufacturer. Requests for information have also come from South America and Europe.

The managing director of the company, said that he was sending as much information

United Kingdom (Contd.):

as possible to manufacturers of foodstuffs in Scotland and England. Samples were also being provided for laboratory tests by individual firms.

The inquiries have come mainly from bakers and manufacturers of fish dishes. The managing director stressed that he would be ready to send samples to anyone who was prepared to introduce the flour into other products as well.

He hoped that concrete orders would result from the information he had given. The high protein content of the flour made it ideal for export in various forms to countries which were trying to overcome the problem of malnutrition, and everything would depend, he said, on how favorably individual manufacturers regarded the results of their tests.

Scientists would subject the samples to intensive tests, looking particularly for protein content and the quantity of amino acids. The firms would then decide whether the product was suitable for inclusion in their foods.

He also stated that, as well as selling the flour to British companies, he was interested in large-scale export. His firm was ready to manufacture and send the flour to South American and African countries if they were capable of distributing the product by themselves.

If orders were placed in really substantial numbers, he added, he would probably approach bodies like the Board of Trade and the Colonial Office for financial and other aid in producing and marketing the flour.

Americans who were carrying out research in the same field had the use of a substantial Government grant, he pointed out, and it would be helpful if similar backing could be instituted in Britain. (Fish Trades Gazette, September 14, 1963.)

* * * * *

TROPICAL FISH RESOURCES OVERRATED:

Can the production of fish from tropical seas continue to expand until it rivals that of the temperate and cold seas--now the source of about 80 percent of the world's sea fishing? Scientists, who presented a paper at the recent Annual Meeting of the British Association under the title "Tropical Fisheries Resources," think not. The total production of fish in tropical seas by mechanized methods is now about 6 million tons a year out of a world total of about 40 million tons. About 40 percent of tropical production consists of tuna and related species, about 40 percent is of herring-like species, leaving about 20 percent of other fish, mostly line and trawl-caught bottom fish. However, with the spectacular increase of the last few years, the total tuna landings are now only about 0.5 million tons annually, and some of these tuna resources are now showing some signs of overfishing.

The tropical continental shelves are mostly very narrow and limited in area compared with those which form the great fishing banks of colder seas, and the productivity in terms of plankton and other fishing food produced per acre is relatively low, due to a chain of events which inhibits the upwelling of cold water to the surface. It is only in these upwelling areas that production equals that of cold seas, and these areas are few and far between.

Nevertheless, there are certain areas where further exploitation could take place, particularly with surface shoaling fish in the Atlantic and in the Western Indian Ocean off the African coast. Much more, too, can be done with the tropical shrimp fisheries. The northeast South American stocks show great promise, and there is much activity in the Arabian Sea and the Bay of Bengal. The Bight of Biafra, on the West African coast, the East Indian shelf and several other tropical continental slopes could all bring spectacular results if properly developed.

There has been a great deal of talk about the possibilities of exploiting the world's tropical fish resources to the fullest. The British scientists have done a valuable service in establishing that while warmer seas will yield more, the potentialities are overrated. The most urgent need is surely for European countries to rationalize fish production in the rich and overexploited fishing grounds of the North. One could almost say now that the fishing problems of the developed countries are more pressing than those of the emerging countries, where the problems of production are basically more simple to resolve than the primarily economic dilemma in which the heavily capitalized mechanized fleets now find themselves. (World Fishing, October 1963.)

## Uruguay

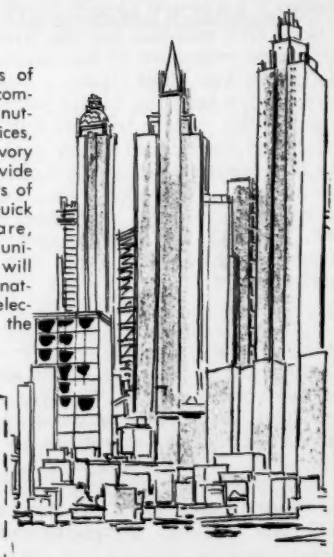
IMPORTS AND EXPORTS OF FISHERY PRODUCTS, 1962:

In 1962, Uruguay's exports of fishery products amounted to 4,000 metric tons valued at US$173,000, while fishery imports totaled 322 tons (205 tons of cod fish valued at $160,000 and 117 tons of other seafood valued at $454,000).

Uruguay's imports in 1962 included 2 fishing vessels with a combined value of $334,000. (United States Embassy, Montevideo, October 21, 1963.)

TUNA WALDORF SALAD

Generous chunks of protein-rich tuna combined with fresh nutmeats, red apple slices, crisp lettuce, and savory salad dressing provide all the vital nutrients of a hearty meal. Quick and easy to prepare, Tuna Waldorf has universal appeal that will delight the discriminating, satisfy the selective, and please the particular.



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|---|---|
| 2 cans (6-½ or 7 ounces each) tuna | ¼ cup chopped nutmeats |
| 1 cup diced apples | ½ cup mayonnaise or salad dressing |
| ½ cup chopped celery | Lettuce |

Drain tuna. Break into large pieces. Combine all ingredients except lettuce. Serve on lettuce. Serves 6.

--From Fisheries Marketing Bulletin: "Protein Treasure from the Seven Seas." Issued by the National Marketing Services Office, U. S. Bureau of Commercial Fisheries, Chicago 5, Ill.

## Foreign Fisheries Briefs

SOVIET NEW FLOATING CANNERY ACTIVE IN NORTH PACIFIC AND BERING SEA:

The Konstantin Sukhanov, the 5th in the 12,000-ton Andrei Zakharov class of crab- and fish-canning factoryships, is active in the North Pacific, according to a Soviet report.

Russian king crab factoryship Andrei Zakharov.

This new vessel left Vladivostok during the last week in September 1963 and is expected to be at sea for over a year. She was built in the Admiralty shipyards in Leningrad. (Unpublished sources.)

SOVIET NORTH PACIFIC FISHING VESSELS REPORT GOOD CATCHES:

Good fish catches for the first 9 months of 1963 were reported by two Soviet fising vessels of the Far East fleets. A large refrigerated stern trawler of the Kamchatka fleet caught 8,000 metric tons of fish. This amount was the annual catch goal set for this type of vessel and it was reached well ahead of schedule. The catch was a record, exceeding that of any of the large stern trawlers in 1962. In 1962, the average catch for large refrigerated stern trawlers was about 5,500 metric tons.

A medium trawler (SRT) in the Aleutian fishing expedition reported a 9-month catch of 2,000 metric tons, of which about 1,400 tons were ocean perch. This vessel, the German Titov, had been reported operating in the North Pacific and Bering Sea in 1962 as well as in 1963. In 1962, the average annual catch for this type of vessel was 1,400 metric tons. The record catch for a medium trawler was 3,200 tons in 1961. (Unpublished sources.)

SOVIET PLANS DEEP-WATER FISHING IN BERING SEA:

The Soviet press and radio reported on October 9, 1963, that a Soviet fishing survey expedition has found that fishing can be done effectively at depths between 200 and 350 fathoms. The expedition was reported to have discovered an area about 500 miles long in the Bering Sea where "stable" catches of ocean perch, halibut, and other fish can be made throughout the year by deep-water fishing. One trawler made hauls of 13,000 to 22,000 pounds of sablefish and halibut in that deep area.

The State Committee for Fishery Economy has decided to make the Bering Sea the "chief deep-fishing grounds next year." Soviet Far East fishermen intend to get one-fifth of their annual catch in that area. The Far East fisheries usually produce about one-third of the annual Soviet fisheries landings. (Unpublished sources.)

SOVIET FISHING FLEETS IN EASTERN NORTH PACIFIC AND BERING SEA DECLINE IN OCTOBER:

Following the pattern of previous years, the Soviet fishing fleet decreased during the fall months in the North Pacific (including the Gulf of Alaska) and the eastern Bering Sea. In late October a fleet of about 30 vessels was active in these areas. About 16 trawlers and support vessels were reported fishing mainly ocean perch in the Albatross Bank area southeast of Kodiak Island. A single whale factoryship and its fleet of whale catchers were operating near the western Aleutians. Three stern trawlers remained in the area north of Adak and Atka Islands and were reportedly taking ocean perch.

In early October, a single Soviet exploratory fishing vessel was reported operating off the southwest coast of Canada's Vancouver Island. (Unpublished sources.)

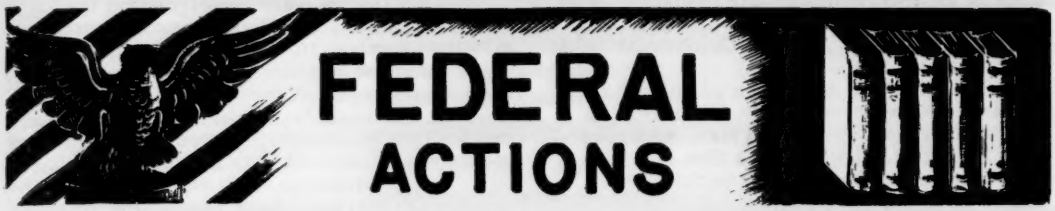
SOVIETS DELIVER FROZEN FISH TO CUBA:

In mid-October, the Soviet refrigerated cargo vessel Burevestnik delivered 1.3 million pounds of frozen fish to Santiago on the southeastern shore of Cuba. This cargo vessel belongs to the Estonian fishing fleet based at Tallinn on the Gulf of Finland. Vessels of the Estoninan fleet operate regularly on Georges Bank in the Northwest Atlantic Ocean and off the west coast of Africa. (Unpublished sources.)

Notes: (1) These briefs were abstracted and compiled by the U. S. Bureau of Commercial Fisheries, Branch of Foreign Fisheries and Trade.

(2) See Commercial Fisheries Review, November 1963 p. 84; September 1963 p. 97; August 1963 p. 112.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 697




## Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

PETITION REQUESTS REVISION OF CANNED TUNA STANDARDS:

On September 27, 1963, the National Canners Association (NCA) petitioned the U. S. Food and Drug Administration (FDA) to amend the Standard of Identity for canned tuna to permit the use of sodium acid pyrophosphate as an optional ingredient. The addition of this substance to canned tuna would prevent the formation of struvite (magnesium ammonium phosphate), a harmless crystalline substance which sometimes forms in cans of tuna and other canned fishery products after processing. The crystals, which may appear a few days after processing or after storage, in no way affect the wholesomeness of canned tuna, but are detrimental to its texture.

The petition is the result of several years of research carried out in industry and NCA laboratories. The investigations have been coordinated by a special industry committee, under the chairmanship of the manager of NCA's Northwest Research Laboratory.

The NCA petition would amend the Standard of Identity for canned tuna by inserting the following paragraph: "(g) For purposes of inhibiting the formation of struvite sodium acid pyrophosphate may be added in a quantity not to exceed in total 0.15 gram for each ounce of net weight of the finished product."

Labeling requirements would be amended as follows: "(7) Where the canned tuna contains the optional ingredient listed in paragraph (g) of this section, the label shall bear the statement 'pyrophosphate added' or 'With added pyrophosphate'." (NCA Fishery Information Bulletin, October 11, 1963.)

* * * * *

SMOKED FISH FROM GREAT LAKES AREA TO BE DISTRIBUTED AS A FROZEN FOOD:

Smoked fish from the Great Lakes area will henceforth be stored and distributed as a frozen food, according to an announcement made October 30, 1963, by the Food and Drug Administration (FDA) and the National Fisheries Institute.

The Institute, representing 90 to 95 percent of the United States fish smoking and curing production and dollar value, advised the FDA Commissioner of this and other steps which the industry will undertake to insure against further instances of a botulism outbreak caused by smoked fish. The botulism toxin does not develop below freezing temperature.

The Institute's action follows FDA's recommendation on October 25, 1963, that all smoked fish products from the Great Lakes area should be destroyed. The FDA's warning applied only to smoked fish, NOT to fresh, frozen, pickled, or canned fish. The Institute's action does not change the situation with respect to smoked fish already distributed.

"The Institute is to be commended for its prompt action in dealing with an emergency situation," the FDA Commissioner said. "The measures they have agreed to adopt are consistent with recommendations of the FDA's advisory committee on botulism. They will be adequate to prevent botulism while technological studies are being made to develop practices for long-range application," the Commissioner said.

Following is the full text of the Institute's letter of commitment to the Food and Drug Administration:

"The National Fisheries Institute and its members, representing 90 to 95 percent of the United States fish smoking and curing production and dollar value, recognize the exist-

ence of an emergency in our industry. We agree with the intent of the Food and Drug Administration advisory of October 25, 1963.

"To enable the American consumer to continue to enjoy and we the producers to continue to market smoked fish, we agree, with respect to Great Lakes fish and fish processed in plants located in the Great Lakes area to:

"1. Review and improve all sanitation and handling practices throughout the entire chain of production from and including vessels, transportation, processing plants, distribution, and retailing operations to the consumer.

"2. Smoke the fish in the best possible fashion, employing better technology and utilizing more scientific methods.

"3. Freeze the product upon completion of the smoking, whether film vacuum-packed or bulk-packed, and to store and distribute the product in that condition to our customers.

"4. Plainly mark all packages containing smoked fish 'Perishable--Keep Frozen.'

"In the case of the bulk-packed product, to supply the retailer with a placard which will read 'Perishable--Keep Frozen' to be displayed with the product."

## Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

FEDERAL STANDARDS FOR GRADES OF FROZEN RAW BREADED FISH PORTIONS: Voluntary standards amended for grades of frozen raw breaded fish portions have been promulgated by the U. S. Department of the Interior. The standards were published in the October 18, 1963, Federal Register. They will become effective, with one possible exception, on November 17, 1963. The amended standards supersede the standards which have been in effect since March 23, 1960. The proposed amendment to these standards was published in the Federal Register of August 16, 1963.

The standards were developed by the Bureau of Commercial Fisheries, Fish and Wildlife Service, in cooperation with the industry and the National Fisheries Institute, an industry trade association. Interested persons had until September 16, 1963, to submit written comments, suggestions, or amendments with respect to the amended regulations to the Director, U. S. Bureau of Commercial Fisheries. As a result, the amended standards were adopted with one change (section 266.5) that realigns the requirements for more direct and simplified application. The revised part will become effective November 17, 1963, or on any date subsequent thereto at the election of the U. S. Bureau of Commercial Fisheries, but not later than July 1, 1963.

The standards include raw breaded fish portions cut from frozen fish blocks. The U. S. Grade A is the highest quality product; U. S. Grade B is acceptable in all respects. Frozen raw breaded fish portions which do not meet the A or B grades are considered substandard.

Firms processing the fish in accordance with the standards and under the continuous inspection of the Government have the privilege of displaying the Department of the Interior "shield of quality" upon the product. The United States voluntary standards for grades of frozen raw breaded fish portions as shown in October 18, 1963, Federal Register follow:

**Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior**

**SUBCHAPTER G—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS, THEREOF AND CERTAIN OTHER PROCESSED FOOD PRODUCTS**

**PART 266—UNITED STATES STANDARDS FOR GRADES OF FROZEN RAW BREADED FISH PORTIONS [1]**

On page 8412 of the FEDERAL REGISTER of August 16, 1963, there was published a notice and text of a proposed amendment of part 266—United States Standards for Grades of Frozen Raw Breaded Fish Portions—of Title 50, Code of Federal Regulations.

Interested persons were given until September 16, 1963, to submit written comments, suggestions of objections with respect to the proposed revised part. Two responses to the proposal were received.

After consideration of all relevant matters presented, including the proposal set forth in the aforesaid notice, the proposed revised part is hereby adopted with one change and is set forth below. A

[1] Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug and Cosmetic Act.

change was made in § 266.5 to realign the requirements of that section for more direct and simplified application.

The revised part is issued under the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e).

This part shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER except that the requirements of § 266.5 shall become effective on such date or on any date subsequent thereto at the election of the applicant but not later than July 1, 1964.

STEWART L. UDALL,
*Secretary of the Interior.*

OCTOBER 11, 1963.

Sec.
266.1 Description of the product.
266.2 Styles of frozen raw breaded fish portions.
266.3 Grades of frozen raw breaded fish portions.
266.5 Labeling requirements for styles of frozen raw breaded fish portions.
266.11 Determination of the grade.
266.21 Definitions.
266.25 Tolerances for certification of officially drawn samples.

AUTHORITY: §§ 266.1 to 266.25 issued under 16 U.S.C. 742e.

### § 266.1 Description of the product.

Frozen raw breaded portions are clean, wholesome, rectangular-shaped unglazed masses of cohering pieces (not ground) of fish flesh coated with breading. The portions are cut from frozen fish blocks; are coated with a suitable, wholesome batter and breading; and are packaged and frozen in accordance with good commercial practice. They are maintained at temperatures necessary for the preservation of the product. Frozen raw breaded fish portions weigh more than 1½ ounces, and are at least ⅜-inch thick. Frozen raw breaded fish portions contain not less than 75 percent, by weight, of fish flesh. All portions in an individual package are prepared from the flesh of one species of fish.

### § 266.2 Styles of frozen raw breaded fish portions.

(a) *Style I—Skinless portions.* Portions prepared from fish blocks which have been made with skinless fillets.

(b) *Style II—Skin-on-portions.* Portions prepared from fish blocks which have been made with demonstrably acceptable skin-on fillets.

### § 266.3 Grades of frozen raw breaded fish portions.

(a) "U.S. Grade A" is the quality of frozen raw breaded fish portions that (1) possess good flavor and odor and (2) rate a total score of not less than 85 points for those factors of quality that are rated in accordance with the scoring system outlined in this part.

(b) "U.S. Grade B" is the quality of frozen raw breaded fish portions that (1) possess at least reasonably good flavor and odor and (2) rate a total score of not less than 70 points for those factors of quality that are rated in accordance with the scoring system outlined in this part.

(c) "Substandard" is the quality of frozen raw breaded portions that meet the requirements of § 266.1, Description of Product, but otherwise fail to meet the requirements of "U.S. Grade B".

TABLE 1—SCHEDULE OF POINT DEDUCTIONS PER SAMPLE UNIT OF 10 PORTIONS

| | | Factors scored | | Method of determining score | Deduct |
|---|---|---|---|---|---|
| Frozen state | 1 | Condition of package | | Small degree: Moderate loose breading and/or moderate frost<br>Large degree: Excessive loose breading and/or excessive amount frost. | 3<br>6 |
| | 2 | Ease of separation | | Minor: Hand separated with difficulty. Each affected<br>Major: Separated only by knife or other instrument. Each affected. | 1<br>2 |
| | 3 | Broken portion | | Break or cut greater than ½ width or length. Each affected | 10 |
| | 4 | Damaged portion | | Mashed, mechanically and/or physically injured, misshaped or mutilated.[1]<br>Minor: 1 to 5 instances. Each affected<br>Major: Over 5 instances. Each affected | <br>2<br>4 |
| | 5 | Uniformity | Size | Deviation in length or width between the 2 largest and 2 smallest portions is:<br>Up to ¼ inch<br>Over ¼ inch and up to ½ inch<br>Over ½ inch | <br>0<br>3<br>10 |
| | 6 | Uniformity | Weight | Weight ratio of the 2 heaviest divided by the 2 lightest portions:<br>Over 1.0 but not over 1.2<br>Over 1.2 but not over 1.3<br>Over 1.3 but not over 1.4<br>Over 1.4 | <br>0<br>3<br>5<br>10 |
| Cooked state | 7 | Distortion | | Minor: Bending, shrinking, twisting—¼ to ½ inch. Each affected.<br>Major: Excessive bending, shrinking, twisting—over ½ inch. Each affected. | 1<br>2 |
| | 8 | Coating defects | | Bare spots, blistering, ridges, breaks, curds: [1]<br>Minor: 1 to 6 instances. Each affected<br>Major: Over 6 instances. Each affected | <br>1<br>2 |
| | 9 | Blemishes | | Skin (except for style II), blood spots, bruises, and discolorations: [1]<br>Minor: 1 to 6 instances. Each affected<br>Major: Over 6 instances. Each affected | <br>2<br>4 |
| | 10 | Bones | | Portions containing bones (potentially harmful). Each affected | 10 |
| | 11 | Texture | Coating | Small degree: Moderately dry, soggy, doughy, or tough<br>Large degree: Farinaceous (mealy), pasty, very tough | 5<br>15 |
| | 12 | Texture | Fish flesh | Small degree: Moderately dry, soft, mushy<br>Large degree: Dry to the point of fibrousness, very mushy, tough, or rubbery (skin for style II). | 5<br>15 |

[1] An instance=each 1/16 square inch (¼-inch square).

### § 266.5 Labeling requirements for styles of frozen raw breaded fish portions.

Section 260.86 (a) (b) and (c) of Part 260 states the requirements for the use of approved grade marks, inspection marks and combined grade and inspection marks on processed fishery products. When an approved inspection mark is used on Style II (§ 266.2) of frozen raw breaded fish portions, that style shall be conspicuously revealed on the label as having been made from "skin-on fillets".

### § 266.11 Determination of the grade.

The grade is determined by examining the product in the frozen and cooked states and is evaluated in accordance with the following factors:

(a) *Factors rated by score points.* Points are deducted for variations in the quality of each factor in accordance with the schedule in table 1. The total points deducted is subtracted from 100 to obtain the score. The maximum score is 100; the minimum score is 0.

(b) *Factors not rated by score points.* The factor of "flavor and odor" is evaluated organoleptically by smelling and tasting, after the product has been cooked in accordance with § 266.21.

(1) Good flavor and odor (essential requirements for a Grade A Product) means that the cooked product has the typical flavor and odor of the indicated species of fish and of the breading and is free from rancidity, bitterness, staleness, and off-flavors and off-odors of any kind.

(2) Reasonably good flavor and odor (minimum requirements of a Grade B Product) means that the cooked product is lacking in good flavor and odor but is free from objectionable off-flavors and off-odors of any kind.

### § 266.21 Definitions.

(a) Selection of the sample unit: The sample unit shall consists of 10 frozen raw breaded fish portions taken at random from one or more packages as required. The fish portions are spread out on a flat pan or sheet and are examined according to table 1. Definitions of factors for point deductions are as follows:

(b) Examination of sample, frozen state: (1) "Condition of package" refers to the presence in the package of loose breading and/or loose frost.

(2) "Ease of separation" refers to the difficulty of separating the portions from each other or from the packaging material.

(3) "Broken portion" means a portion with a break or cut equal to or greater than one-half the width or length of the portion.

(4) "Damaged portion" means a portion that has been mashed, physically or mechanically injured, misshaped or multilated to the extent that its appearance is materially affected. The amount of damage is measured by using a grid composed of squares ¼-inch x ¼-inch (that is, squares with an area of 1/16 square inch each) to measure the area of the portion affected. No deductions

are made for damage of less than 1/16 square inch.

(5) "Uniformity of size" refers to the degree of uniformity in length and width of the frozen portions. Deviations are measured from the combined lengths of the two longest minus the combined lengths of the two shortest and/or the combined widths of the two widest minus the combined widths of the two narrowest portions in the sample. Deductions are not made for overall deviations in length or width up to 1/4 inch.

(6) "Uniformity of weight" refers to the degree of uniformity of the weights of the portions. Uniformity is measured by the combined weight of the two heaviest portions divided by the combined weight of the two lightest portions in the sample. No deductions are made for weight ratios less than 1.2.

(c) (1) Cooked state means the state of the product after being cooked in accordance with the instructions accompanying the product. If, however, specific instructions are lacking, the product being inspected is cooked as follows:

(2) Transfer the product, while still frozen, into a wire mesh fry basket large enough to hold the fish portions in a single layer and cook by immersing them 3–5 minutes in liquid or hydrogenated cooking oil heated to 350 to 375° F. After cooking, allow the fish portions to drain 15 seconds and place them on a paper napkin or towel to absorb excess oil.

(d) Examination of sample, cooked state.

(1) "Distortion" refers to the degree of bending of the long axis of the portion. Distortion is measured as the greatest deviation from the long axis. Deductions are not made for deviations of less than 1/4 inch.

(2) "Coating defects" refers to breaks, lumps, ridges, depressions, blisters or swells and curds in the coating of the cooked product. Breaks in the coating are objectionable bare spots through which the fish flesh is plainly visible. Lumps are objectionable outcroppings of breading on the portion surface. Ridges are projections of excess breading at the edges of the portions. Depressions are objectionable visible voids or shallow areas that are lightly covered by breading. Blisters are measured by the swelling or exposed area in the coating resulting from the bursting or breaking of the coating. Curd refers to crater-like holes in the breading filled with coagulated white or creamy albumin. Instances of these defects are measured by a plastic grid marked off in 1/4-inch squares (1/16 square inch). Each square is counted as 1 whether it is full or fractional.

(3) "Blemishes" refers to skin (except for Style II), blood spots or bruises, objectionable dark fatty flesh, or extraneous material. Instances of blemishes refers to each occurrence measured by placing a plastic grid marked off in 1/4-inch squares (1/16 square inch) over the defect area. Each square is counted as 1 whether it is full or fractional.

(4) "Bones" means the presence of potentially harmful bones in a portion. A potentially harmful bone is one that after being cooked is capable of piercing or hurting the palate.

(5) "Texture defects of the coating" refers to the absence of the normal textural properties of the coating which are crispness and tenderness. Defects in coating texture are dryness, sogginess, mushiness, doughyness, toughness, pastyness, as sensed by starchiness or other sticky properties felt by mouth tissues and/or mealiness.

(6) "Texture defects of the fish flesh and texture of skin in Style II" refers to the absence of the normal textural properties of the cooked fish flesh and to the absence of tenderness of the cooked skin in Style II. Normal textural properties of cooked fish flesh are tenderness, firmness, and moistness without excess water. Texture defects of the cooked flesh are dryness, mushiness, toughness, and rubberyness. Texture defects of the cooked skin in Style II are mushiness, rubberyness, toughness, and stringiness.

(e) General definitions. (1) "Small" (overall assessment) refers to a condition that is noticeable but is not seriously objectionable.

(2) "Large" (overall assessment) refers to a condition that not only is noticeable but is seriously objectionable.

(3) "Minor" (individual assessment) refers to a defect that slightly affects the appearance and/or utility of the product.

(4) "Major" (individual assessment) refers to a defect that seriously affects the appearance and/or utility of the product.

(f) *Minimum fish flesh content* refers to the minimum percent, by weight, of the average fish flesh content of 3 or more portions per sample unit as determined by the following method:

(1) *Equipment needed.* (i) Water bath (for example, a 3 to 4 liter beaker).

(ii) Balance accurate to 0.1 gram.

(iii) Clip tongs of wire, plastic, or glass.

(iv) Stop-watch or regular watch readable to a second.

(v) Paper towels.

(vi) Spatula, 4-inch blade with rounded tip.

(vii) Nut picker.

(viii) Thermometer (immersion type) accurate to ±2°F.

(ix) Copper sulfate crystals ($CuSO_4 \cdot 5H_2O$)—one pound.

(2) *Procedure.* (i) Weigh all portions in the sample while they are still hard frozen.

(ii) Place each portion individually in a water bath that is maintained at 63° F. to 86° F. and allow to remain until the breading becomes soft and can easily be removed from the still frozen fish flesh (between 10 to 80 seconds for portions held in storage at 0° F.). If the portions were prepared using batters that are difficult to remove after one dipping, redip them for up to 5 seconds after the initial debreading and remove residual batter materials.

NOTE: Several preliminary trials may be necessary to determine the exact dip time required for "debreading" the portions in a sample unit. For these trials only, a saturated solution of copper sulfate (1 pound of copper sulfate in 2 liters of tap water) is necessary. The correct dip time is the minimum time of immersion in the copper sulfate solution required before the breading can easily be scraped off: *Provided*, (1) That the "debreaded" portions are still solidly frozen and (2) only a slight trace of blue color is visible on the surface of the "debreaded" fish portions.

(iii) Remove the portion from the bath; blot lightly with double thickness paper toweling; and scrape off or pick out coating from the fish flesh with the spatula or nut picker.

(iv) Weigh all the "debreaded" fish portions.

(v) Calculate the percent of fish flesh in the sample using the following formula:

$$\text{Percent fish flesh} = \frac{\text{Weight of fish flesh (d)}}{\text{Weight of raw breaded portions (a)}} \times (100)$$

§ 266.25 **Tolerances for certification of officially drawn samples.**

The sample rate and grades of specific lots shall be certified in accordance with Part 260, of this chapter (Regulations Governing Processed Fishery Products, Vol. 25 F.R. 8427 September 1, 1960) except that a sample unit shall consist of 10 portions taken at random from one or more packages as required.

Second Issue: These standards supersede the standards which have been in effect since March 23, 1960.



## Department of the Treasury

COAST GUARD

OCEANOGRAPHIC EFFORT EXPANDED: The U. S. Coast Guard's Oceanographic Unit was reorganized in July 1963, as part of the agency's increasing effort to expand our knowledge of the seas. A new unit, comprising 19 military and civilian oceanographers and technicians was established in Washington, D. C.

Before the reorganization, the Coast Guard's primary oceanographic interest was in support of the International Ice Patrol, and an office was maintained at the Woods

Hole Oceanographic Institution. While that program will be maintained, increased emphasis will be placed in the broader fields of arctic operations, and research from offshore towers and ocean station vessels. All oceanographic data obtained by the Coast Guard will be processed by the National Oceanographic Data Center, and published by the Coast Guard in a new series of oceanographic reports. (Newsletter, August 31, 1963, National Oceanographic Data Center.)

BUREAU OF CUSTOMS

DUTY-FREE TREATMENT OF CERTAIN LOBSTER CRATES AND CERTAIN LARGE BOXES FOR SHIPMENT AND RESHIPMENT OF FISH:

A Bureau of Customs decision concerning the duty-free treatment of certain lobster crates and certain large boxes was issued on October 14, 1963. The text of the decision as it appeared in the Federal Register, October 18, 1963, follows:

> Under the authority conferred by § 10.41a(a), Customs Regulations, as amended by Treasury Decision 55981 of August 27, 1963, I hereby designate as "instruments of international traffic" within the meaning of section 322(a), Tariff Act of 1930, as amended, lobster crates, being containers which because of their unique and substantial construction are used in the shipment and reshipment of live lobsters; and fish boxes which because of their large size and substantial construction are used and reused in the transportation of fish. The lobster crates and fish boxes described may be released under the procedures provided for in § 10.41a. This decision will be published in the FEDERAL REGISTER and as T.D. 56021.
>
> [SEAL] PHILIP NICHOLS, JR.,
> *Commissioner of Customs.*

## White House

FISHERY ITEMS TO BE CONSIDERED FOR TRADE AGREEMENT NEGOTIATIONS:

On October 21, 1963, the White House announced that public hearings were due to be held, starting December 2, on a list of products to be considered for possible reduction in import duties, or for other tariff modifications, in forthcoming trade agreement negotiations. A detailed announcement, including the full list of products to be considered, was published in the Federal Register of October 22, 1963.

All imported fishery products were listed for consideration. For most items, import duties may be reduced as much as 50 percent of the July 1962 rate. Duties may be reduced to zero for products with a rate of duty equivalent to 5 percent ad valorem, or less. Duties on fish oils may be eliminated, in an agreement with the European Economic Community, if the President finds that such action would help maintain or expand United States exports of like articles. Duty-free items may be "bound" against increase to insure continuance of present tariff treatment.

The purpose of listing all items was to give every affected party an equal opportunity to present his case for or against tariff reductions. Articles now listed may be reserved from negotiations at the completion of hearings if information is developed justifying such action.

The final list of articles on which the United States will negotiate will not be completed until the testimony presented at these hearings, along with other available information, has been reviewed and analyzed, and the President has received the views of the Special Representative for Trade Negotiations, the Tariff Commission, and other Government agencies whose advice may be requested.

Reductions in United States duties as a result of the GATT negotiations will not occur until other nations have agreed to similar reductions of duties for articles of interest to United States producers. Once such agreement is reached, the Trade Expansion Act requires that generally, reductions be made gradually over a period of four years.

The Trade Information Committee, an inter-agency Committee chaired by a representative of the Office of the Special Representative for Trade Negotiations, heard testimony of interested parties beginning December 2, 1963, for items on Schedule 1, Animal and Vegetable Products. This Schedule includes most of the fishery products.

The Tariff Commission also held concurrent hearings at which testimony was received about the economic effects of possible tariff reductions on United States industries producing like or directly competitive articles. The information received during these hearings will be an important part of their

investigation, the results of which will be reported to the President in six months. Requests to appear before the Commission were due to be filed in writing on or before November 20, 1963, and addressed to the Secretary, United States Tariff Commission, Washington, D. C. 20436. Requested information follows:

a. Item number of the Tariff Schedules of the United States covering articles on which testimony will be presented;

b. Name, address, and telephone number of witness and organization represented;

c. Whether testimony will be on behalf of importer or domestic producer; and

d. A careful estimate of time required for presentation of testimony.

The Trade Information Committee heard testimony relevent to any aspect of the negotiations, but particularly devoted attention to (1) reductions in rates of duty which the United States should seek to obtain from other nations, (2) non-tariff barriers imposed by other nations which the United States should seek to have removed or modified, (3) articles upon which elimination, reduction, or continuance of present United States duties should be offered, and (4) other United States import restrictions which should be offered for modification or continuance.

All requests to present oral testimony, were due to be received by the Executive Secretary of the Trade Information Committee not later than November 20, 1963. Requests, submitted in an original and three copies, were to include the following information:

1. Name, address, and telephone number of (a) party submitting the request, (b) the official position of the person submitting the request, and (c) the person presenting the oral testimony;

2. The description and item number of the commodity shown in the Tariff Schedule (to the extent practicable);

3. The subject to be dealt with in the proposed testimony, and in the case of import restrictions other than duties, with sufficient particularity to identify the restriction to be discussed; and

4. A brief indication of the position to be taken, and the amount of time requested for the presentation of oral testimony, and if more than 15 minutes was requested, the reasons therefore.

Any interested party was invited to submit a written brief to the Committee concerning the subject matter of this hearing. Each party presenting oral testimony was requested to file a brief. Written briefs concerning commodities contained in Schedule 1 were due by November 25, 1963. Briefs were to be submitted in twenty (20) copies, one of which was under oath or affirmation.

Suggestions for the preparation of written briefs were sent to all parties requesting to present oral testimony and furnished to other interested parties upon request to the Executive Secretary.

A list of the principal fishery products to be considered for duty reduction and their present rates of duty follows:

List of Principal Fishery Products to be Considered for Duty Reductions (up to 50 percent reduction unless otherwise indicated)

| Tariff Item No. | Brief Description | Present Duty |
|---|---|---|
| 106.60 | Frogs and frog legs, fresh or frozen | 5% 1/ |
| 107.65 | Frog meat, prepared or preserved . . . | 12½ |
| | Fish, fresh, chilled, or frozen; whether or not whole, but not otherwise prepared or preserved: | |
| 110.10 | Sea herring, smelts, and tuna. . . . . | Free |
| | Whole or processed by removal of heads, viscera, fins or any combination thereof, but not otherwise processed: | |
| 110.15 | Cod, cusk, eels, haddock, hake, shad, sturgeon, and fresh-water fish . . . . . | 0.5¢ per lb. 1/ |
| 110.20 | Halibut and salmon . . . . . | 0.5¢ per lb. 1/ |
| | Mackerel: | |
| 110.25 | Fresh or chilled . . . . . | 0.5¢ per lb. 1/ |
| 110.28 | Frozen . . . . . | 0.75¢ per lb. |
| | Swordfish: | |
| 110.30 | Fresh or chilled . . . . . | 1¢ per lb. 1/ |
| 110.33 | Frozen . . . . . | 0.75¢ per lb. 1/ |
| 110.35 | Other . . . . . | 1¢ per lb. 1/ |
| | Scaled: | |
| 110.40 | In bulk or in immediate containers weighing with their contents over 15 pounds each . . . . . | 1¢ per lb. 1/ |
| 110.45 | Other . . . . . | 12.5% |
| 110.47 | Skinned and boned, and frozen into blocks each weighing over 10 pounds, imported to be minced, ground, or cut into pieces of uniform weights and dimensions . . . . . | 1¢ per lb. 1/ |
| | Otherwise processed (fillets): | |
| | Cod, cusk, haddock, hake, pollock, and Atlantic ocean perch (rosefish): | |
| 110.50 | Under quota . . . . . | 1.875¢ per lb. 2/ |
| 110.55 | Over the quota . . . . . | 2.5¢ per lb. 2/ |
| 110.57 | Wolffish (sea catfish) . . . . . | 1¢ per lb. 1/ |
| 110.60 | Other . . . . . | 1.5¢ per lb. 1/ |
| | Fish, dried: | |
| 111.10 | Cod, cusk, haddock, hake, and pollock | 0.2¢ per lb. 1/ |
| 111.15 | Shark fins . . . . . | 0.53¢ per lb. 1/ |
| 111.18 | Other . . . . . | 0.3125¢ per lb. 1/ |
| | Fish, salted or pickled: | |
| | Cod, cusk, haddock, hake, and pollock: | |
| 111.22 | Whole; or processed by removal of heads, fins, viscera, scales, vertebral columns, or any combination thereof . . . . . | 0.2¢ per lb. 1/ |

(List continued on next page)

List of Principal Fishery Products to be Considered for Duty Reductions (up to 50 percent reduction unless otherwise indicated) (Contd.)

| Tariff Item No. | Brief Description | Present Duty |
|---|---|---|
| 111.28 | Otherwise processed | 0.75¢ per lb. 1/ |
| 111.32 | Herring: In bulk or in immediate containers weighing with their contents over 15 pounds each | 0.1¢ per lb. 1/ |
| 111.37 | Other | 12.5% |
| 111.40 | Mackerel: In bulk or in immediate containers weighing with their contents over 15 pounds each | 0.2¢ per lb. 1/ |
| 111.44 | Other | 10% |
| 111.48 | Salmon | 6.5% |
| 111.52 | Other: In bulk or in immediate containers weighing with their contents over 15 pounds each: Alewives | 0.5¢ per lb. |
| 111.56 | Other | 1.25¢ per lb. 1/ |
| 111.60 | In immediate containers weighing with their contents not over 15 pounds each | 25% |
| 111.64 | Fish, smoked or kippered: Cod, cusk, haddock, hake, and pollock: Whole; or processed by removal of heads, viscera, vertebral columns, or any combination thereof | 0.5¢ per lb. 1/ |
| 111.68 | Otherwise processed | 1¢ per lb. 1/ |
| 111.72 | Herring: Whole or beheaded: Hard smoked | 0.1¢ per lb. 1/ |
| 111.76 | Other | 0.625¢ per lb. 1/ |
| 111.80 | Otherwise processed | 0.9¢ per lb. 1/ |
| 111.84 | Mackerel | 6.25% |
| 111.88 | Salmon | 10% |
| 111.92 | Other | 6.25% |
| 112.01 | Fish, prepared or preserved in any manner, not in oil, in airtight containers: Anchovies: In containers weighing with their contents not over 15 pounds each | 12.5% |
| 112.03 | Other | 1¢ per lb. |
| 112.05 | Bonito and yellowtail | 12.5% |
| 112.08 | Herring: In containers weighing with their contents not over 15 pounds each: In tomato sauce, smoked, or kippered, and in immediate containers weighing with their contents over 1 pound each | 8% |
| 112.10 | Other | 5% 1/ |
| 112.12 | Other | 1¢ per lb. |
| 112.14 | Pollock | 12.5% |
| 112.18 | Salmon | 15% |
| 112.20 | Sardines: In containers weighing with their contents not over 15 pounds each: In immediate containers weighing with their contents under 8 ounces each | 10% |
| 112.22 | Other | 6.25% |
| 112.24 | Other | 1¢ per lb. |
| 112.30 | Tuna: In containers weighing with their contents not over 15 pounds each: Under the quota | 12.5% |
| 112.34 | Over quota | 25% |
| 112.36 | Other | 12.5% |
| 112.40 | Fish, prepared or preserved in any manner, in oil, in airtight containers: Anchovies | 12% |
| 112.42 | Bonito and yellowtail | 15% |
| 112.46 | Herring | 25.5% |
| 112.48 | Pollock: Smoked | 15% |
| 112.50 | Not smoked | 25.5% |
| 112.52 | Salmon | 25.5% |
| 112.54 | Sardines: Valued not over 18 cents per pound (including weight of immediate container) | 30% |
| 112.58 | Valued over 18 but not over 23 cents per pound (including weight of immediate container): Neither skinned nor boned: Smoked | 12.5% |
| 112.62 | Not smoked | 20% |

List of Principal Fishery Products to be Considered for Duty Reductions (up to 50 percent reduction unless otherwise indicated) (Contd.)

| Tariff Item No. | Brief Description | Present Duty |
|---|---|---|
| 112.66 | Skinned or boned | 30% |
| 112.70 | Valued over 23 but not over 30 cents per pound (including weight of immediate container): Neither skinned or boned | 15% |
| 112.74 | Skinned or boned | 30% |
| 112.78 | Value over 30 cents per pound (including weight of immediate container): Neither skinned nor boned: Smoked | 12.5% |
| 112.82 | Not smoked | 15% |
| 112.86 | Skinned or boned | 24% |
| 112.90 | Tuna | 35% |
| 112.94 | Other | 25.5% |
| 113.01 | Fish balls, cakes, puddings, pastes, and sauces (including any of such articles in airtight containers): Pastes and sauces | 8% |
| 113.05 | Balls, cakes, and puddings: In oil | 25.5% |
| 113.08 | Not in oil: In immediate containers weighing with their contents not over 15 pounds each: In airtight containers | 3% 1/ |
| 113.11 | Other | 12.5% |
| 113.15 | Other | 1¢ per lb. |
| 113.20 | Fish sticks and similar products of any size or shape, fillets, or other portions of fish, if breaded, coated with batter, or similarly prepared, whether or not described or provided for elsewhere in this part: Neither cooked nor in oil | 20% |
| 113.25 | Other | 30% |
| 113.30 | Fish roe, fresh, chilled, frozen, prepared, or preserved: Sturgeon roe | 30% |
| 113.35 | Other fish roe: Boiled and in airtight containers | 5.5% |
| 113.40 | Other | 4¢ per lb. 1/ |
| 113.50 | Fish, prepared or preserved, not specially provided for: In oil | 25.5% |
| 113.56 | Not in oil: In bulk or in immediate containers weighing with their contents over 15 pounds each: Tuna | 1¢ per lb. 1/ |
| 113.58 | Other | 1¢ per lb. 1/ |
| 113.60 | Other | 12.5% |
| 114.01 | Shellfish, fresh, chilled, frozen, prepared, or preserved (including pastes and sauces): Clams: In airtight containers: Razor clams (Siliqua patula) | 7.5% |
| 114.05 | Other | 20% |
| 114.10 | Other | Free |
| 114.15 | Crabs: Crabmeat: Fresh, chilled, or frozen | 15% |
| 114.20 | Prepared or preserved (including pastes and sauces): In airtight containers | 22.5% |
| 114.25 | Other | 15% |
| 114.30 | Other | Free |
| 114.34 | Oysters: In airtight containers: Smoked | 4.5¢ per lb. (including wt. of immed. container) |
| 114.36 | Other | 6¢ per lb. (including wt. of immed. container) |
| 114.40 | Other | Free |
| 114.45 | Other shellfish | Free |
| 114.50 | Shellfish juices in airtight containers: Clam juices | 17.5% |
| 114.55 | Oyster juice | 6¢ per lb. (including wt. of immediate container) |

(List continued on next page)

List of Principal Fishery Products to be Considered for Duty Reductions (up to 50 percent reduction unless otherwise indicated) (Contd.)

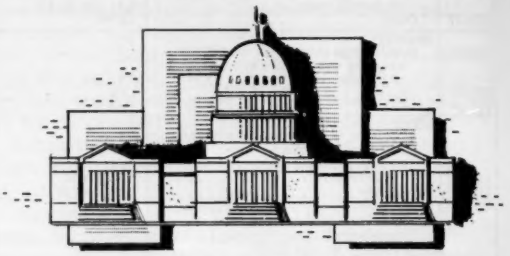
| Tariff Item No. | Brief Description | Present Duty |
|---|---|---|
| | Marine-animal oils: | |
| | Fish-liver oils: | |
| 177.02 | Cod | Free |
| 177.04 | Other | 5% ad val. 1/3/ |
| | Fish oils other than liver oils: | |
| 177.12 | Anchovy | 1.5¢ per lb. 3/ plus 10% ad val. |
| 177.14 | Cod | Free |
| 177.16 | Shark | 0.85¢ per lb. 3/ plus 4% ad val. |
| 177.20 | Eulachon | 1.5¢ per lb. 3/ |
| 177.22 | Herring | 0.92¢ per lb. 3/ |
| 177.24 | Menhaden | 3-1/3¢ per lb. 3/ |
| 177.26 | Other (except cod) | 1.5¢ per lb. 3/ plus 10% ad val. |
| | Other marine-animal oils: | |
| 177.30 | Seal | 1.9¢ per lb. 3/ |
| | Sperm: | |
| 177.32 | Crude | 0.065¢ per lb. 1/3/ |
| 177.34 | Other than crude | 0.47¢ per lb. 1/3/ |
| 177.36 | Whale (except sperm) | 1.26¢ per lb. 3/ |
| 177.40 | Other | 1.5¢ per lb. 3/ plus 10% ad val. |
| 178.05 | Sod oil | 1.9¢ per lb. 3/ |
| 178.10 | Hydrogenated or hardened oils, fats, and greases; and lard substitutes whether or not containing lard | 5¢ per lb. 3/ |
| | Edible preparations: | |
| 182.05 | Antipasto | 10% |
| | Balls, hash, pastes, puddings, and similar forms, all the foregoing of vegetables and meat, or fish (including shellfish), or both: | |
| 182.11 | Other than corned beef hash | 17½3/ |
| | Soups, soup rolls, soup tablets or cubes, and other soup preparations: | |
| 182.50 | Containing oysters or oyster juice | 6¢ per lb. (including wt. of immediate container) |
| 182.52 | Other | 14% ad val.3/ |
| | Animal feeds: | |
| | Tankage; dead fish and whales; fish and whole scrap, meal and solubles; homogenized condensed fish and whales; all the foregoing not fit for human consumption: | |
| 184.54 | Cod-liver solubles | 10% |
| 184.55 | Other | Free |
| | Sponges, marine: | |
| 190.85 | Grass, velvet, or yellow | 7.5% ad val. |
| 190.87 | Sheepswool | 12% ad val. |
| 190.90 | Hardhead or reef | 4% ad val. 1/ |
| 190.93 | Other | 7.5% ad val. |
| 455.02 | Agar agar | 15% ad val. |
| 455.06 | Isinglass | 17% ad val. |
| | Fish glue: | |
| 455.36 | Valued under 40 cents per pound | 0.5¢ per lb. plus 7.5% ad val. |
| 455.38 | Valued 40 cents or more per pound | 4¢ per lb. plus 12.5% ad val. |
| | Sodium salts: | |
| 426.88 | Sodium alginate | 10% |
| | Natural or cultured pearls and parts thereof, drilled or not drilled, but not strung (except temporarily) and not set: | |
| 741.05 | Natural | 3% ad val. 1/ |
| 741.06 | Cultured | |

1/Duty on this item may be reduced to zero.
2/May be reserved from negotiations provided that a request in behalf of the industry concerned is filed with the Tariff Commission within 60 days from October 21, and the Commission finds and advises the President that economic conditions in the industry have not substantially improved since the finding of injury was made by the Commission in their report 7-47, October 12, 1956.
3/Duty on this item may be reduced to zero, in agreement with the European Economic Community, if the President finds that such action would help maintain or expand United States exports of like articles.
Note: All import duties shown under the column "Present Duty" are the same as those "existing July 1, 1962," except for item 426.88, sodium alginate, which was 12.5% ad valorem on that date.
Source: Prepared by the U. S. Bureau of Commercial Fisheries based on excerpts from Tariff Schedules of the United States.

## Eighty-Eighth Congress

## (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and



allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANTIDUMPING ACT AMENDMENT: H. R. 8886 (Rogers), Oct. 22, 1963, and H. R. 9069 (Brotzman), Nov. 7, 1963, both introduced in House, to amend section 201 of the Antidumping Act, 1921, with respect to the determination of injury or threatened injury to an industry in the United States; referred to the Committee on Ways and Means.

CONSERVATION OF MARINE FISHERIES RESOURCES: Fishing in United States Territorial Waters (Hearings before the Merchant Marine and Fisheries Subcommittee of the Committee on Commerce, U. S. Senate, 88th Congress, 1st Session) 139 pp., illus., printed. Contains the hearings held Sept. 5 and 6, 1963, on S. 1988, to prohibit fishing in the territorial waters of the United States and in certain other areas by persons other than nationals or inhabitants of the United States; reports of various Federal agencies; statements by Members of Congress, Government officials, various fishing associations, and members of the industry; and statements and letters submitted to the Committee.

On Oct. 24, 1963, Senator Bartlett presented to the Senate a resolution of the Gulf States Marine Fisheries Commission approving the bill S. 1988 (Congressional Record, page 19159).

EXEMPT TRANSPORTATION OF AGRICULTURAL AND FISHERY PRODUCTS: The Surface Transportation Subcommittee of the Senate Committee on Commerce on Oct. 24, 1963, concluded its hearings on S. 1061, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products and passengers, and for other purposes.

FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT: Registration of Economic Poisons (Hearings before the Subcommittee on Departmental Oversight and Consumer Relations of the Committee on Agriculture, House of Representatives, 88th Con-

gress, 1st Session), 72 pp., printed. Contains hearings held Aug. 21 and 22, 1963, on H. R. 6828, H. R. 6913, and H. R. 7336, to amend the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, to provide for labeling of economic poisons with registration numbers, to eliminate registration under protest, and for other purposes; report from the Department of Agriculture; and statements from Members of Congress and officials of Federal agencies.

On Nov. 14, 1963, the Subcommittee ordered H. R. 6828 (amended) favorably reported to the full Committee.

The Senate on Oct. 21, 1963, received the report (S. Rept. 573) on S. 1605, to amend the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, to provide for labeling of economic poisons with registration numbers to eliminate registration under protest, and for other purposes.

S. Rept. 573, Registration of Pesticide Chemicals (Oct. 21, 1963, report of the Committee on Agriculture, U. S. Senate, 88th Congress, 1st Session), 29 pp., printed. The Committee recommended passage with amendment of S. 1605. Contains a short explanation of the bill, need for legislation, departmental reports and changes in existing law.

The Senate on Oct. 22, 1963, passed with Committee amendment S. 1605.

Senator Neuberger spoke from the floor of the Senate on Nov. 14, 1963, recommending proposed legislation to regulate chemical pesticides (Congressional Record, page 20748.)

FOREIGN ASSISTANCE ACT OF 1961 AMENDMENT CONCERNING FISHERIES: The Senate on Nov. 7, 1963, adopted by a vote of 57 to 29 an amendment to H. R. 7885, to amend further the Foreign Assistance Act of 1961, as amended, and for other purposes. The amendment introduced by Kuchel and Engle of California is as follows: " '(k) No assistance shall be furnished under this Act to any country which (1) has extended, or hereafter extends, its jurisdiction for fishing purposes over any area of the high seas beyond that recognized by the United States, and (2) hereafter imposes any penalty or sanction against any United States fishing vessel on account of its fishing activities in such area. The provisions of this subsection shall not be applicable in any case in which the extension of jurisdiction is made pursuant to international agreement to which the United States is a party.'" Senator Kuchel had inserted in the Congressional Record (pages 20253-20254) several editorials from newspapers located in California.

The Senate on Nov. 13, 1963, continued consideration of H. R. 7885. During this consideration, the Senate approved the amendment which would make domestically-produced fishery products available under Titles I and IV of Public Law 480. However, at the insistence of Senator Carlson, language was adopted which would eliminate fish flour from such program until approved by the Food and Drug Administration. Senator Douglas on Nov. 14, 1963, moved to reconsider the vote eliminating fish flour, but his motion was tabled on the motion of Senator Carlson.

The Senate on Nov. 15, 1963, by a record vote of 63 to 17, passed with amendment H. R. 7885 authorizing funds to continue for the foreign assistance program for fiscal year 1964. The Senate insisted on its amendment, asked for a conference with the House, and appointed as conferees Senators Fulbright, Sparkman, Humphrey, Hickenlooper, and Aiken.

The House on Nov. 18, 1963, disagreed to Senate amendments to H. R. 7885, agreed to the conference requested by the Senate, and appointed as conferees Congressmen Morgan, Zablocki, Hays, Adair, and Frelinghuysen.

HEALTH, EDUCATION, AND WELFARE DEPARTMENT APPROPRIATIONS FY 1964: H. Rept. 774, Departments of Labor, and Health, Education and Welfare, and Related Agencies Appropriation Bill, 1964 (Sept. 25, 1963, conference report from the Committee of Conference, House of Representatives, 88th Congress, 1st Session), 12 pp., printed. The Committee of Conference came to agreement and presented their recommendations to the respective Houses on H. R. 5888, making appropriations for the Departments of Labor, and Health, Education, and Welfare, and related agencies, for the fiscal year ending June 30, 1964, and for other purposes. Included are funds for the Food and Drug Administration; milk, food, interstate and community sanitation; and water pollution control. The milk, food, interstate and community sanitation programs assure that only safe water, milk, shellfish and other marine food, and food supplies are served to the public; also provides for research and technological assistance programs on shellfish and other marine foods at the two new shellfish sanitation research centers which are to be constructed. The water pollution program provides for regional laboratories located in strategic points throughout the country to promote research and training activities and provide a base of action of State, interstate, and Federal agencies cooperating to eliminate water pollution.

The House and the Senate on Sept. 26, 1963, agreed to the Conference Report. The President on Oct. 11, 1963, signed the bill H. R. 5888 into Public Law 88-136.

INTERNATIONAL NORTH PACIFIC FISHERIES PROBLEMS: Senator Gruening on Oct. 24, 1963, presented to the Senate a resolution from the Cordova, Alaska, Chamber of Commerce, urging the representatives of the United States, Canada, and Japan to renew the abstention principle at their meeting in Tokyo on Sept. 16, 1963. Senator Gruening also commented, in part, "Now that the Senate has given its approval to S. 1988 which would make possible the enforcement of our 3-mile fishing limit it is imperative that we take the second important step in this area which would be to extend the fisheries limit to 12 miles if and when a Governor of a State makes such a request. My bill, S. 1816, would make this possible. . . ." (Congressional Record, pages 19165-19166.)

Senator Gruening on Nov. 5, 1963, presented a statement to the Senate concerning the ". . .invasion of Alaska's crab-fishing grounds by Russian fishing vessels and the pulling up and destruction of American fishermen's crab traps." In discussing the problem, he stated, in part, "Two remedies, of course, are immediately available: The first would be to extend the fishing limits for all fisheries to 12 miles, and the second--and even more pertinent--would be to extend the limits for taking of crustacea and shellfish to the

Continental Shelf, which would be a wholly proper procedure since crab and shellfish exist on the bottom of sea. . . ." He also inserted three recent articles from the New York Times. (Congressional Record, pages 20005-20006.)

Senator Bartlett on Nov. 12, 1963, presented a statement to the Senate calling attention to the threat by Soviet fishermen to the king crab fishery off Kodiak Island in Alaska. (Congressional Record, pages 20477-20479.)

OCEANOGRAPHY WORLD CONFERENCE: H. J. Res. 794 (Wilson) introduced in House Nov. 4, 1963, authorizing the Secretary of State to convene in the United States in 1965 a World Conference on Oceanography; referred to Committee on Foreign Affairs. In his statement on introduction of his resolution, Representative Wilson stated that "It would enable us to bring together the top scientists of the world to exchange information, to map joint projects, and in general to bring the world up to date on the progress man has made in exploring the sea and extracting from it some of the riches it contains."

RESEARCH PROGRAMS: On Nov. 18-19, 1963, the House Select Committee on Government Research opened and held hearings on current Government research programs. Testimony was received from various public witnesses and Federal officials including the Science Adviser to the Secretary of the Interior.

SMALL BUSINESS DISASTER LOANS: H. R. 9111 (Staebler) introduced in the House Nov. 13, 1963, to amend the Small Business Act to authorize loans to small business concerns injured by their inability to process and market certain products because of disease or toxicity in such products; referred to the Committee on Banking and Currency.

TRADE AGREEMENTS PROGRAM: A message from the President (H. Doc. 170), Seventh Annual Report on The Trade Agreements Program, was received in the House and the Senate on Oct. 21, 1963. The message transmits the seventh Annual Report of the President of the United States on the trade agreements program. Contains the letter of transmittal; United States and world trade in perspective; GATT and the implementation of United States policy; the removal of foreign restrictions against United States exports; tariff negotiations; safeguarding actions taken in 1962; looking ahead--the Trade Expansion Act, and Appendix A.

TRANSPORTATION ACT OF 1963: The Surface Transportation Subcommittee of the Senate Committee on Commerce on Oct. 24, 1963, concluded its hearings on S. 1062, to provide for strengthening and improving the national transportation system and for other purposes.

VESSEL CONSTRUCTION SUBSIDY AMENDMENTS: Fishing Vessel Subsidies (Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, 88th Congress, 1st Session) 97 pp., printed. Contains hearings held on Aug. 6 and 7, 1963, on H. R. 2172 and H. R. 2643, to amend the Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes; reports of Federal agencies; statements by members of Congress, officials of various Federal agencies, and industry members; and additional communications submitted to the Committee.

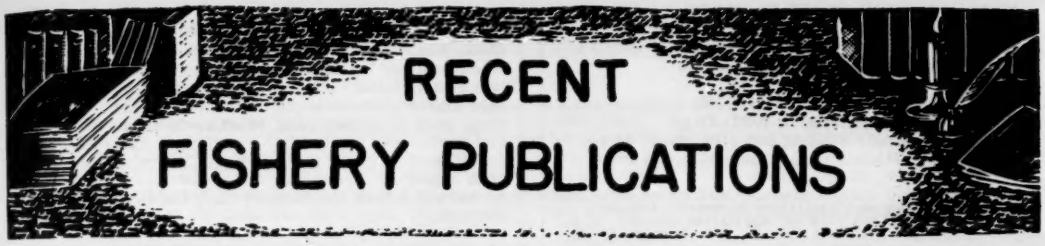
The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries on Nov. 13, 1963, held hearings on S. 1006, to amend the Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes. Testimony was heard from various departmental witnesses. The hearing was adjourned subject to call.

WATER POLLUTION CONTROL ADMINISTRATION: H. R. 9127 (St. Onge) introduced in the House Nov. 14, 1963, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to provide grants for research and development, to increase grants for construction of municipal sewage treatment works, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate waters, and for other purposes; referred to the Committee on Public Works.

## CORRECTION

In the flow diagram for individually frozen peeled and deveined shrimp, fig. 2, p. 2, November 1963, the arrows should be pointed downward from top to bottom.

Separate No. 692, the reprint of the article, shows the corrected figure.

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SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

Number Title

CFS-3202 - Maryland Landings, July 1963, 3 pp.
CFS-3242 - Georgia Landings, May 1963, 3 pp.
CFS-3244 - Maryland Landings, 1962 Annual Summary, 9 pp.
CFS-3245 - Virginia Landings, May 1963, 3 pp.
CFS-3256 - Massachusetts Landings, January 1963, 5 pp.
CFS-3260 - Frozen Fishery Products, July 1963, 8 pp.
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CFS-3264 - Shrimp Landings, April 1963, 7 pp.
CFS-3274 - Maryland Landings, June 1963, 3 pp.
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CFS-3284 - Gulf Coast Shrimp Data, February 1963, 15 pp.
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CFS-3294 - Hawaii Fisheries, 1962 Annual Summary, 4 pp.
CFS-3295 - Alabama Landings, June 1963, 3 pp.
CFS-3299 - Gulf Coast Shrimp Data, April 1963, 21 pp.
CFS-3300 - Alabama Landings, July 1963, 3 pp.
CFS-3301 - New York Landings, July 1963, 4 pp.
CFS-3306 - Shrimp Landings, May 1963, 7 pp.
CFS-3313 - Louisiana Landings, July 1963, 2 pp.
CFS-3316 - South Atlantic Fisheries, 1962 Annual Summary, 6 pp.
CFS-3318 - Florida Landings, August 1963, 8 pp.

Wholesale Dealers in Fishery Products, 1962 (Revised):
SL-12 - Virginia, 11 pp.
SL-16 - Florida, 15 pp.

Sep. No. 692 - Handling and Packing of Frozen Breaded Shrimp and Individually Frozen Peeled and Deveined Shrimp.

Sep. No. 693 - Five Years of Voluntary Fishery Products Inspection.

Sep. No. 694 - Foreign Fisheries Briefs.

New England's Commercial Fisheries, Conservation Note 13, 8 pp., illus., December 1962. Discusses briefly the history of the New England fisheries, and the fisheries for bottomfish--haddock, ocean perch, flounders, cod, whiting, pollock, scup, white hake, cusk, and butterfish; pelagic fish--sea herring, menhaden, tuna, mackerel, and sharks; anadromous fish--alewives, shad, and salmon; and shellfish--lobster, sea scallop, bay scallop, clams, crabs, oysters, and mussels. The final section covers the industrial fishery; its expansion in the late 1940's and early 1950's, the nutritional value of industrial fish byproducts, and the development of fish protein concentrate for human consumption.

A Program of Fishery Research and Services, North Atlantic Region, Circular 164, 23 pp., illus., printed, May 1963. Outlines the North Atlantic Region's share in the responsibility assigned to the Bureau of Commercial Fisheries by the Congress, "To aid in maintaining the welfare of the fisheries of the United States and its territories by conducting research, investigations, and studies and by providing marketing, informational, and other services for the commercial fishing industry and the general public." Discusses the regional structure--biological research, exploratory fishing and gear research, technological research, technical advisory unit, marketing, statistical services, market news, financial assistance, safety at sea, and resource management. Also covers the status of the fisheries and research programs for trawl fish, menhaden, herring, oysters, sea scallops, clams, and blue crabs. Presents information on service programs of the technical advisory unit, statistical work, market news, market promotion and test kitchen research, direct financial assistance, resource management, safety at sea, and discusses the fishing industry of tomorrow.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, WYATT BLDG., SUITE 611, 777 14TH ST. NW., WASHINGTON, D. C. 20005.

| Number | Title |
|---|---|
| MNL-17 | - Italian Fishing Industry, 1962, 11 pp. |
| MNL-26 | - Taiwan Fisheries in 1962, 21 pp. |
| MNL-75 | - Argentina's Fishing Industry, 1962, 13 pp. |
| MNL-84 | - Faroe Islands Fisheries, 1962, and 1963 Trends, 32 pp. |

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE PUBLICATION SERVICES, U. S. BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, P. O. BOX 3830, HONOLULU, HAWAII, 96812.

On the Requirements for a Research Submarine, by O. A. Sokolov, 9 pp., processed. (Translated from the Russian, Methods and Results in Underwater Research, vol. 14, 1962, pp. 116-122.)

Studies on Biting of Fishes. I--On Feeding in the Goldfish, by Teiji Kariya, 11 pp., illus., processed. (Translated from the Japanese, Suisan Zoshoku, vol. 7, no. 3, March 1960, pp. 29-36.)

A Study on the "Biting" of Skipjack in the Live-Bait Fishery. Part 1--Relation between the "Biting" and the Alimental Canal in the Tohoku Sea Area, by Hideyuki Hotta, Teiji Kariya, and Toru Ogawa, 32 pp., illus., processed. (Translated from the Japanese, Bulletin of the Tohoku Regional Fisheries Research Laboratory, no. 13, March 1959, pp. 60-78.)

A LIMITED NUMBER OF COPIES OF THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES IS AVAILABLE FROM THE TRANSLATION PROGRAM, BRANCH OF REPORTS, U. S. BUREAU OF COMMERCIAL FISHERIES, 2725 MONTLAKE BLVD. E., SEATTLE, WASH., 98102.

The Application of Biometrics in Taxonomy, by A. A. Liubishchev, OTS 60-51147, 11 pp., printed.

On the Dynamics of Coastal Currents, by V. G. Labeish, OTS 60-51146, 7 pp., printed.

Experimental Data on the Toxicology of the Insecticide Heptachlor, by V. I. Osetrov, OTS 61-11488, 6 pp., printed.

Pacific Salmon--Selected Articles from Soviet Periodicals, OTS 60-51139, 284 pp., printed.

The Pattern of Climatic Fluctuation Structure in the Arctic during the Last Decades, by V. L. Petrov, OTS 60-51154, 9 pp., printed.

Stations for Improving Natural Propagation of Far East Salmon, by G. V. Nikolskii, OTS 6-21098, 9 pp., printed.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, April and June 1963, 8 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the months indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, August 1963, 17 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, September 1963, 8 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, September 1963, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 1014, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, August 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, September 1963, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, August and September 1963, 21 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New

Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--July and August 1963, 16 and 18 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; fish meal, oil, and solubles; and landings at Fulton Fish Market docks; for the months indicated.

Production of Fishery Products in Selected Areas of Virginia, Maryland, and North Carolina, 1962, by William N. Kelly, 40 pp., processed. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) A summary of commercial landings of fish and shellfish and the production of crab meat and shucked oysters as reported by producers and wholesalers from selected principal fishing localities of Virginia, Maryland, and North Carolina. The statistics contained in this annual summary represent the approximate commercial fisheries production only and do not represent complete commercial landings or production for a given area, individual state, or the Chesapeake Bay area as a whole. However, the statistics give an indication as to the trend in fisheries production for the specific areas designated and reflect the over-all production trend by species, localities, and states.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, September 1963, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

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"Anesthetizing and Air-Transporting Young White Sturgeons," by Duane T. Rodman, article, The Progressive Fish-Culturist, vol. 25, no. 2, April 1963, pp. 71-78, illus., processed, single copy 25 cents.

"Artificial Hybridization of the Muskellunge and Grass Pickerel in Ohio," by Donald L. Tennant and George Billy, article, The Progressive Fish-Culturist, vol. 25, no. 2, April 1963, pp. 68-70, illus., processed, single copy 25 cents.

"Bibliography on Biology of Cod, Gadus morhua, and Related Species," by John P. Wise, Fishery Bulletin 215 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62), 60 pp., printed, 40 cents, 1963.

"A Cost Analysis of Farm Ponds in Tomkins County, New York," by Henry A. Regier, article, The Progressive Fish-Culturist, vol. 25, no. 3, July 1963, pp. 144-148, processed, single copy 25 cents.

"Folic Acid as an Anti-Anemia Factor for Brook Trout," by Arthur M. Phillips, Jr., article, The Progressive Fish-Culturist, vol. 25, no. 3, July 1963, pp. 132-134, processed, single copy 25 cents.

"Kidney Disease of Salmonid Fishes and the Analysis of Hatchery Waters," by James W. Warren, article, The Progressive Fish-Culturist, vol. 25, no. 3, July 1963, pp. 121-131, processed, single copy 25 cents.

"A Portable A. C.-D. C. Back-Pack Fish Shocker Designed for Operation in Ontario Streams," by H. R. McCrimmon and A. H. Berst, article, The Progressive Fish-Culturist, vol. 25, no. 3, July 1963, pp. 159-162, illus., processed, single copy 25 cents.

"Salmon and Steelhead Runs at Eagle Creek National Fish Hatchery," by John Parvin and Marvin A. Smith, article, The Progressive Fish-Culturist, vol. 25, no. 2, April 1963, pp. 97-100, processed, single copy 25 cents.

"Trout Culture in Denmark," by F. Bregnballe, article, The Progressive Fish-Culturist, vol. 25, no. 3, July 1963, pp. 115-120, illus., processed, single copy 25 cents.

## MISCELLANEOUS PUBLICATIONS

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* * * * *

ABALONE:

"Diet and Growth in the Black Abalone, Haliotis cracherodii," by David Leighton and Richard A. Boolootian, article, Ecology, vol. 44, no. 2, Spring 1963, pp. 227-238, illus., printed, single copy $5. Circulation Office, Duke University Press, Box 6697, College Station, Durham, N. C.

ALGAE:

Production Bases for the Development of Unicellular Algae, by N. P. Arutyunyan, OTS 63-21044, 14 pp., processed, 50 cents. (Translated from the Russian, Izvestiya Akademii Nauk Armyanskoy SSSR, Biologicheskiye Nauki, vol. 15, no. 11, November 1962, pp. 85-93.) Office of Technical Services, U. S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., February 1, 1963.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ANATOMY:

"The Caudal Neurosecretory System of Fishes," by Howard A. Bern and Noboru Takasugi, article, General and Comparative Endocrinology, vol. 2, 1962, pp. 96-110, printed. Academic Press Inc., 111 Fifth Ave., New York 3, N. Y.

Investigation of the Possible Utility of Meristic Characters of Fishes as Indicators of Coastal Circulation, Final Report, 2 pp., printed, $1.10. University of Oregon, Eugene, Oreg., 1963. (For sale by the Office of Technical Services, U. S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C.) Meristic characters of fish (numbers of vertebrae, fin spines, and fin rays) give a good account of the thermal history during early development. Preliminary studies indicate that by intensive sampling of populations of juveniles of certain species as they arrive from their larval tour in the plankton, a good assessment could be made of the direction this larval tour took.

ANTIBIOTICS:

"Antibiotic Dips for Preserving Fillets," article, Canadian Fisherman, vol. 50, no. 8, August 1963, pp. 22-23, printed, single copy C$2. National Business Publications Ltd., Gardenvale, Que., Canada.

"Que Faut-Il Penser de la Glace aux Antibiotiques? Offre-t-Elle un Reel Interet?" (What Must One Think of the Antibiotic Dip? Does It Offer Any Real Interest?), article, France Peche, no. 75, July-August 1963, pp. 47-50, printed in French. France Peche, Boite Postale 179, Lorient, France.

ASCORBIC ACID:

"Ascorbic Acid Content in Edible Tunicates from the Italian Seas," by Cosimo Sebastio (Exptl. Inst., Pescara, Italy), article, Chemical Abstracts, vol. 57, October 29, 1962, 11614a, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

ATLANTIC:

The Bionomics of the Fisheries Resources of the Eastern Tropical Atlantic, by Alan R. Longhurst, Colonial Office Fishery Publication No. 20, 1963, 71 pp., illus., processed, $3.60. Sales Section, British Information Service, 845 Third Ave., New York 22, N. Y.

BACTERIOLOGY:

"The Behavior of Food-Poisoning Bacteria in Fish Preserves and Oils," by K. O. Schwerin (Bur. Vet. Res. Animal Health, Greifswald, Germany), article, Chemical Abstracts, vol. 57, October 29, 1962, 11605g, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

BERMUDA:

Annual Report of the Director of Agriculture and Fisheries for the Year 1962, 21 pp., printed. Department of Agriculture and Fisheries, Hamilton, Bermuda, February 1963. Includes a section on work of the Fisheries Division. Discusses the drafting of new fisheries regulations, installation of fish-freezing and cold-storage facilities at a marketing center, interviewing of and discussion of problems with local fishermen, and organization of an Association of Fishermen.

BIOCHEMISTRY:

"Biochemical Changes in Fish Muscle during Rigor Mortis," by D. J. Nazir and N. G. Magar, article, Journal of Food Science, vol. 28, January-February 1963, pp. 1-7, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Marine Sterols. V--Isolation of 7,24(28)-Ergostadien-38-OL from Starfish," by U. H. M. Fagerlund and D. R. Idler, article, Journal of the American Chemical Society, vol. 81, 1959, p. 401, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

Nucleotide Concentration in Codling (GADUS CALLARIAS) Muscle Passing Through Rigor Mortis at 0°, by N. R. Jones and J. Murray, Torry Memoir No. 56, printed. Torry Research Station, Aberdeen, Scotland, 1961.

"Nucleotide Degradation in the Muscle of Iced Haddock (Gadus aeglefinus), Lemon Sole (Pleuronectes microcephalus), and Plaice (Pleuronects platessa)," by Bung-Orn Kassemsarn and others, article, Journal of Food Science, vol. 28, January-February 1963, pp. 28-37, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

BLOATER:

"Food of the Bloater, Coregonus hoyi, in Lake Michigan," by LaRue Wells and Alfred M. Beeton, article, Transactions of the American Fisheries Society, vol. 92, no. 3, pp. 245-255, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

BLOOD:

"Blood pH and Mortality in Rainbow Trout (Salmo gairdnerii) and Sockeye Salmon (Oncorhynchus nerka)," by R. E. E. Jonas, Harcharan Sehdeve, and N. Tomlinson, article, Journal of the Fisheries Research Board of Canada, vol. 19, July 1962, pp. 619-624, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

CALIFORNIA:

Publications of Department of Fish and Game, 11 pp., printed, May 1963. State Printing Division, Documents Section, N. 7th St. at Richards Blvd., Sacramento 14, Calif.

CANADA:

Journal of the Fisheries Research Board of Canada, vol. 20, no. 4, July 1963, 251 pp., illus., printed, single copy C$2. Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, articles on: "Influence of Light and Temperature on the Reproductive Cycle of the Eastern Brook Trout, Salvelinus fontinalis (Mitchill);" by Nancy E. Henderson; "Extent of Atresia in Maturing Ovaries of the Eastern Brook Trout, Salvelinus fontinalis (Mitchill)," by Nancy E. Henderson; "Extractives of Fish Muscle. 3--Amounts, Sectional Distribution, and Variations of Fat, Water-Solubles, Protein and Moisture in Cod (Gadus morhua L.) Fillets," by N. Dambergs; "Observations on the Migration of Young Sockeye Salmon (Oncorhynchus nerka) through a Large, Complex Lake System," by W. E. Johnson and C. Groot; "The Effect of Tagging with Petersen Disc Tags on the Swimming Ability

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of Fingerling Steelhead Trout (Salmo gairdnerii)," by Dan W. Clancy; "Source of Paralytic Shellfish Toxin in the Bay of Fundy," by A. Prakash; "Accelerated Cooling of Wet, Heavily Salted Fish," by A. L. Wood; "Temperature, Salinity and Plankton in the Eastern North Atlantic and Coastal Waters of Britain, 1957. II--The Relationships between Species and Water Bodies," by B. McK. Bary; and "An Investigation of Herring (Clupea harengus L.) Spawning Using Free-Diving Techniques," by S. N. Tibbo, D. J. Scarratt, and P. W. G. McMullon.

Oceanography and Canadian Atlantic Waters, by H. B. Hachey, Bulletin No. 134, Cat. No. Fs 94-134, 126 pp., illus., printed, C$1.50. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1962.

CANNING:
Refrigerative Canning of Fish Products, by V. P. Zaitsev, 430 pp., printed in Russian. Pishchepromizdat, Mruzooskii, Prospekt No. 1, Moscow, U. S. S. R., 1962.

CHILE:
"Chilean Fishing-Industry Survey," article, Food Technology, vol. 17, April 1963, pp. 32-33, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

Montemar, vol. 1-2, no. 3, March 1963, 47 pp., illus., printed in Spanish with English summary. Universidad de Chile, Instituto de Biologia, Biblioteca, Casilla 13-D, Vina del Mar, Chile. Includes articles on: "Observaciones sobre la Madurez Sexual del Cachalote Macho (Physeter catodon L.), Capturado en Aguas Chilenas" (Observations on the Sexual Maturity of Male Sperm Whales (Physeter catodon L.) Captured in Chilean Waters), by Anelio Aguayo Lobos; and "Cyamidae (Crustacea: Amphipoda) en Physeter catodon L. Capturados en Chile con descripcion de una Nueva Especie Cyamus bahamondei" (Cyamidae (Crustacea: Amphipoda) Parasites on Physeter catodon L. Captured in Chile with a Description of a New Species Cyamus bahamondei), by Ramon Buzeta B.

CHINA:
"The Fisheries of Mainland China," by E. F. Szczepanik, article, Fishing News International, vol. 1, no. 1, 1961, pp. 39-42, printed. Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

CHITIN:
"Studies on Chitin. V--The Action of Mineral Acids on Chitin," by R. H. Hackman, article, Australian Journal of Biological Sciences, vol. 15, 1962, pp. 526-537, illus., printed. Commonwealth Scientific and Industrial Research Organization, 314 Albert St., Melbourne C2, Australia.

CLAMS:
"Variacion Estacional de la Composicion Quimica de la Almeja Babosa (Tapes pullastra, Mont.)" (Seasonal Variation in Chemical Composition of Clam, Tapes pullastra Mont.), by G. Alvarez-Seoane, article, Investigacion Pesquera, vol. 17, 1960, pp. 3-32, illus., printed in Spanish with English summary. Consejo Superior de Investigaciones Cientificas, Universidad de Barcelona, Barcelona, Spain.

"Venus mercenaria (L.) in Southampton Water," by Alan D. Ansell, article, Ecology, vol. 44, no. 2, Spring 1963, pp. 396-397, illus., printed, single copy $5. Circulation Office, Duke University Press, Box 6697, College Station, Durham, N. C.

CLUPEOID FISH:
"Electrophoretic Analysis of the Hemoglobins of Atlantic Clupeoid Fishes," by Carl J. Sindermann and Kenneth A. Honey, article, Copeia, no. 3, September 25, 1963, pp. 534-537, illus., printed, single copy $2.50. American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

COLOMBIA:
Legislacion Nacional de Pesca Y Caza Vigente (National Legislation in Force on Fishing and Hunting), 218 pp., illus., printed in Spanish. Division de Recursos Naturales, Ministerio de Agricultura, Bogota, Colombia, 1963.

COMBINATION VESSEL:
"Aspects of the Combination Fishing Vessels," by J. G. de Wit, article, Holland Shipbuilding, vol. 10, no. 5, 1961, pp. 36-38, printed. The Marine Publication Co., 10 Burgemeester's Jacobplein, Rotterdam, Netherlands.

COMPOSITION:
"Lobster Shell and Hemolymph Composition under Normal and Acidotic Conditions," by Kora K. Hayes, Leon Singer, and W. D. Armstrong (University of Minnesota, Minneapolis, Minn.), article, Chemical Abstracts, vol. 57, July 9, 1962, 1392g, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

CYPRINID FISH:
"Cyprinid Fishes of the Subgenus Cyprinella of Notropis. The Notropis whipplei-analostanus-chloristius Complex," by Robert H. Gibbs, Jr., article, Copeia, no. 3, September 25, 1963, pp. 511-528, illus., printed, single copy $2.50. American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

DECOMPOSITION:
"Formol in Marine Products. The Influence of Treatment by Sulphur Anhydride," by F. Soudan and others, article, Revue des Travaux, Institut Scientifique et Technique des Peches Maritimes, vol. 25, no. 4, 1961, pp. 407-412, printed in French. Institut Scientifique et Technique des Peches Maritimes, 59 Ave. Raymon Poincare, Paris XVI, France.

DRIED FISH:
"Dried Fish Handling in Nigeria. A Report of the West African Stored Products Research Unit," by M. J. Rollings and L. A. W. Hayward, article, Food Manufacture, vol. 37, October 1962, pp. 498-501, printed. Leonard Hill Ltd., 9 Eden St., London NW1, England.

DRYING:
The Drying of Fish, British Patent 893,769, printed. British Patent Office, 25 Southampton Bldgs., London WC2, England.

ENZYMES:
"Enzymatic Studies on the Glycolysis in Fish Muscle," by Fumio Nagayama, article, Bulletin of the Japa-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

nese Society of Scientific Fisheries, vol. 27, November 1961, pp. 1014-1017, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

Fish Muscle Enzymes and Their Technological Significance, by N. R. Jones, Torry Memoir No. 104, printed. Torry Research Station, Aberdeen, Scotland.

"Proteolytic Activity of Tissue Enzymes of Salmon," by E. A. Nasedkina, article, Chemical Abstracts, vol. 57, October 15, 1962, 13096, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

EUROPEAN ECONOMIC COMMUNITY:
Fischereistatistik--Statistique des Peches 1950-1961 (Fishery Statistics, 1950-1961), 74 pp., illus., processed in French and German. Office Statistique des Communautes Europeennes, Statistique Agricole, 188a, Ave. de Tervueren, Brussels 15, Belgium.

FAROE ISLANDS:
Facts about the Faroe Islands, 39 pp., illus., printed. Faroya Banki, Torshavn, Faroe Islands. Discusses, among other subjects, the fishing industry, which is the chief occupation of the Faroese. Covers the coastal and distant-water fishing grounds, types of vessels, principal species landed, chief export markets, and number of men employed in fishing.

Regnskag og Beretning for Aret 1962 (Annual Report for 1962), 20 pp., illus., printed in Danish and English, February 1963. Foroya Banki, Torshavn, Faroe Islands. Discusses the total fish catch during 1962; fishery off Greenland, Iceland, and Norway; production of fish on ice, frozen fillets, and salted herring and other fish; export of dried cod and salt fish; value of holdings and production; increase in the fishing fleet; and financial information.

FEEDS:
"Significance of Fish as Vitamin Carriers in Connection with a Satisfactory Yield of Fodder as a By-product in the Commercial Preparation of Fish," by E. Kraack, article, Chemical Abstracts, vol. 57, July 9, 1962, 1338d, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Supplementation of a Basal Feed with Either Fish Meal or Pure Amino Acids," by Jean Adrian and Raymond Jacquot, article, Chemical Abstracts, vol. 56, June 11, 1962, 14702b, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

FILMS:
List of Films and Filmstrips on Fisheries and Related Subjects, Fourth Edition, 187 pp., processed. Technology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1963. The FAO Fisheries Division has a growing interest in the use of films to promote world-wide exchange of knowledge of fishing gear and methods, fishing boats, fish processing, and fish science in general.

FISH BEHAVIOR:
"Aquarienversuche uber die Scheuchwirkung einer Vorhangs aus Luftblasen bei einigen Susswasserfischen, Besonders bei Aalen" (Aquarium Experiments on the Frightening Effect of an Air-Bubble Curtain on Some Species of Fresh Water Fish, especially Eel), by H. Mohr, article, Protokolle zur Fischereitechnik, vol. 31, no. 7, 1960, pp. 121-129, illus., printed in German. Institut fur Netz- und Materialforschung, Bundesforschungsanstalt, Palmaille 9, Hamburg-Altona 1, Germany.

FISHERY RESEARCH:
Fisheries Laboratory, Lowestoft, by E. C. Haderlie, Technical Rept. ONRL-15-63, 11 pp., printed. Office of Naval Research, London, England, March 21, 1963.

FISH FARMING:
"Cultivating Fish for Food and Sport in Power-Station Water," by R. B. Iles, article, New Scientist, vol. 17, no. 324, January 31, 1963, pp. 227-229, illus., printed, single copy 1 s. (about 14 U. S. cents). Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England. Exotic fish are living in St. Johns Wood, London, in warm water from a power station. By rational use of warmed water all over Britain both native and tropical fish should thrive, to the benefit of the consumer, the gourmet, the angler, and the electricity authorities alike.

"The Salt-Water Fish Farms of the North Adriatic and Their Fauna," by A. Vatova, article, Journal du Conseil, vol. 27, 1962, pp. 109-115, illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund-Slot, Denmark.

FISH FINDER:
"Fish Finder Uses Magnetic Drum Memory," article, New Scientist, vol. 15, August 2, 1962, p. 251, printed. Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

FISHING WITH LIGHTS:
"Lov Chernomorskoi Stavridy na Elektrosviet" (Fishing with Electric Lights for Black Sea Horse Mackerel), by A. Dolgov, article, Rybnoe Khoziaistvo, vol. 37, no. 2, 1961, pp. 53-55, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

FISH MEAL:
"Dye Binding of Soybean and Fish Meal as an Index of Quality," by E. T. Moran, Jr., L. S. Jensen, and J. McGinnis, article, Journal of Nutrition, vol. 79, February 1963, pp. 239-244, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

"Processo Simples de Produzir Farinhas de Peixe Altamente Nutritivas" (Simple Method for Producing Highly Nutritious Fish Meal), by A. Valente de Fonseca Alves da Costa, article, Boletim da Pesca, vol. 13, no. 72, 1961, pp. 55-56, illus., printed in Portuguese. Gabinete de Estudos das Pescas, 644 R. S. Bento, Lisbon, Portugal.

"Pyrethrum in Fish Meal Industry," by J. Olley, article, Journal of the Science of Food and Agriculture,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

vol. 12, no. 9, 1961, p. 130, printed. The Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

FISH OIL:
"Treating Oil - Containing Animal Material, Such as Fish and Fish Offal," by Heinrich M. Ehlert, article, Chemical Abstracts, vol. 58, March 18, 1963, 6132a, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

FISH PASSAGE:
*Rybopropusknye Soorozheniia Sovetskogo Soiuza (Fish Bypass Constructions in the Soviet Union), by Z. M. Kipper and I. V. Mileiko, R. 27583, printed in Russian, 1962.

FISH PROTEIN CONCENTRATE:
"Composition and Biological Quality of Dilis Fish Flour," by Angelina Alcaraz-Bayan, article, Chemical Abstracts, vol. 57, November 26, 1962, 14248b, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Factors Influencing the Nutritional Value of Fish Flour. II--Availability of Lysine and Sulfur Amino Acids," by A. B. Morrison and Z. I. Sabry, article, Canadian Journal of Biochemistry and Physiology, vol. 41, March 1963, pp. 649-655, printed. Division of Administration and Awards, The National Research Council, Sussex St., Ottawa 2, Canada.

"Preparation of Protein-Rich Biscuits from Fish Flour," by R. L. Nath, R. Dutt, and S. L. Pain, article, Bulletin, Calcutta School of Tropical Medicine, vol. 8, no. 4, 1960, pp. 161-162, printed. School of Tropical Medicine, Calcutta, India.

FISH SAUCE:
"Production of Fish Sauce. I--Effect of Commercial Proteolytic Enzymes on the Production of Fish Sauce," by Shigeo Murayama, Dominador L. Calvez, and Prapart Nitayachin (Tokaiku Suiken, Tokyo, Japan), article, Chemical Abstracts, vol. 57, November 26, 1962, 14247g, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

FOOD MANAGEMENT:
Employee Training in Food Service Establishments, by Robert F. Lukowski and Charles E. Eshbach, Food Management Leaflet 7, 10 pp., illus., printed. Cooperative Extension Service, College of Agriculture, University of Massachusetts, Amherst, Mass., March 1963. Discusses the importance of employee training and emphasizes the principles that management needs to keep in mind in developing effective employee training programs. Not an employee training manual but a brief review of the significance of good employee training to the success of the business and an outline of what is essential for an effective employee program. Designed primarily to call to the attention of owners and managers of food service establishments the importance of employee training.

FOOD POISONING:
"Food Poisoning after Eating Fish," by H. Gounelle and M. A. Pointeau-Pouliquen, article, Revue d'Hygiene et de Medicine Sociale, vol. 9, no. 7, 1961, pp. 603-624, printed in French. Revue d'Hygiene et de Medicine Sociale, 120 Blvd. Saint-Germain, Paris 6e, France.

"Food Poisoning Problems of Frozen Seafoods," by J. Liston and H. Raj, article, Journal of the American Dietetic Association, vol. 42, April 1963, p. 336, printed. American Dietetic Association, 620 N. Michigan Ave., Chicago 11, Ill.

FRANCE:
"La Production de la Peche Francaise en 1962" (France's Fish Production in 1962), article, La Peche Maritime, vol. 42, no. 1025, August 1963, pp. 513-518, printed in French, single copy 12 F. (about US$2.45). Les Editions Maritimes, 190, Blvd. Haussman, Paris, France.

FREEZE-DRYING:
Food Service Management, no. 5, August 26, 1963, 7 pp., illus., processed. Cooperative Extension Service, Food Management Program, University of Massachusetts, Amherst, Mass. Discusses a U. S. Department of Agriculture report, Freeze-Dried Foods: Palatability Tests. Covers objectives of the study, a summary of the results, comparison of freeze-dried foods as a group with canned or frozen foods as a group, and significance of the findings. Six shellfish products, among many others, were tested and results showed that they equaled frozen shellfish in all palatability characteristics except flavor.

"Freeze-Drying Equipment," by Martin S. Peterson, article, Food Technology, vol. 16, March 1962, pp. 18-20, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

"Freeze-Drying without Vacuum. A Preliminary Investigation," by L. M. Lewin and R. I. Mateles, article, Food Technology, vol. 16, January 1962, pp. 94-96, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

"Nouveau Procede de Congelation-Sechage" (New Process of Freeze-Drying), article, La Peche Maritime, vol. 42, no. 1025, August 1963, pp. 535-536, illus., printed in French, single copy 12 F. (about US$2.45). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

Recent Advancement in Freeze-Drying, by L. Rey and others, 196 pp., printed. Hermann, 115, Blvd. Saint-Germain, Paris, France, 1962.

FROZEN FOOD:
"Frozen Food Handling Bibliography," article, Frosted Food Field, vol. 35, August 1962, pp. 12-13, 19, printed. Frosted Food Field Inc., 321 Broadway, New York 7, N. Y.

GEAR:
"Science in Overseas Industry--Anchor that Buries Itself in the Seabed," article, New Scientist, vol. 15, August 23, 1962, p. 409, printed. Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

"A Simple and Cheap Design of Large Reel for Commerical Bottom Fishing in Deep Water," by J. F. C. Morgans, article, East African Agricultural and Forestry Journal, vol. 27, no. 3, 1962, pp. 150-153,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

illus., printed. East African Agricultural and Forestry Research Organization, Box 21, Kikuyu, Kenya.

GENERAL:
"The Seas as a Solution to the World's Food Shortage," by M. B. F. Ranken, article, Modern Refrigeration, vol. 65, October 1962, pp. 959-962, printed. Refrigeration Press Ltd., Maclaren House, 131 Great Suffolk St., London SE1, England.

GROUNDFISH:
*Promyslovye Kambaly Dalnego Vostoka (The Flatfish Industry of the Far East), by P. A. Moiseev, R. 27371, printed in Russian, 1946.

HAWAII:
Annual Report to the Governor, July 1, 1961 to June 30, 1962, Department of Land and Natural Resources, State of Hawaii, 50 pp., illus., printed, December 1962. Department of Land and Natural Resources, Honolulu, Hawaii. Includes a section on the work of the Division of Fish and Game. Discusses, among other subjects, the accomplishments of the Fisheries Branch in fresh-water fishery management, salt-water fishery management, and the Honolulu Bait Station.

HERRING:
"De Bereiding van Snelgevroren Gemarineerde Haring" (The Manufacture of Quickfrozen Marinated Herring), by H. Houwing, article, Conserva, vol. 10, no. 9, 1962, pp. 183-186, printed in Dutch. Moorman's Periodieke Pers N. V., 1 Zwarteweg, The Hague, Netherlands.

"Change in the Quality of Dry and Mixed Salted Herring during Storage," by N. N. Rulev, article, Chemical Abstracts, vol. 56, March 19, 1962, 6430d, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Sildundersokelser i Norskhavet med F/F 'Johan Hjort' 3.-14. Desember 1962" (Herring Investigations in the Norwegian Sea on Board the Johan Hjort December 3-14, 1962), by Ole J. Ostvedt, article, Fiskets Gang, vol. 49, no. 28, July 11, 1963, p. 414, illus., printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

KOREA REPUBLIC:
Annual Report for Fishery Products Inspection, 1962, no. 12, 166 pp., illus., printed in Korean with some English translations, April 1963. Central Fisheries Inspection Station, Ministry of Agriculture and Forestry, 103 Wonnam-Dong, Chong-Ro, Seoul, Korea. Contains a general review of the inspection of fishery products in Korea, the present status and results of fishery inspection, and related subjects.

LIBYA:
Establishing a Business in Libya, OBR-63-116, 12 pp., printed, 15 cents, August 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Government policy on investment, entry and repatriation of capital, trade factors affecting investment, business organizations, regulations affecting employment, and taxation.

LIMNOLOGY:
Limnology in North America, edited by David G. Frey, 752 pp., illus., printed, $8.50. University of Wisconsin Press, Madison, Wis., 1963.

LONG-LINE FISHING:
"Linebuktstabeller (Fiskedybden av Floytliner)" (Tables of Bay Lines--Fishing Depth of Floating Lines), by Olav Aasen, article, Fiskets Gang, vol. 49, no. 24, June 13, 1963, pp. 341-346, illus., printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

MEDITERRANEAN:
Mediterranean Brackish-Water Lagoons and Their Exploitation, by R. De Angelis, General Fisheries Council for the Mediterranean Studies and Reviews No. 12, 41 pp., illus., processed. General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

MINK RATIONS:
"Antioxidants and Other Additives for Improving Alaska Fish Waste for Mink Feed," by J. R. Leekley, C. A. Cabell, and R. A. Damon, Jr., article, Journal of Animal Science, vol. 21, November 1962, pp. 762-765, printed. American Society of Animal Production, Colorado State University, Fort Collins, Colo.

MUSKELLUNGE:
The Wisconsin Muskellunge, Its Life History, Ecology, and Management, by Arthur A. Oehmcke and others, Publication 225, 11 pp., illus., printed. Wisconsin Conservation Department, Madison 1, Wis., 1958.

NAMES OF FISH:
The Common Names of Fish, by G. U. Lindberg, OTS 63-21729, 7 pp., processed, 50 cents. (Translated from the Russian, Zoologicheskiy Zhurnal, vol. XXXVIII, no. 12, 1959, pp. 1894-1896.) Office of Technical Services, U. S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., April 30, 1963.

NETS:
"Using the Trammel Net in Canadian Waters," by G. H. Lawler, article, Canadian Fisherman, vol. 50, no. 8, August 1963, pp. 17-20, illus., printed, single copy C$2. National Business Publications Ltd., Gardenvale, Que., Canada.

NEW JERSEY:
Report for 1961/62, 64 pp., illus., printed. New Jersey Division of Fish and Game, Trenton, N. J.

NIGER REPUBLIC:
Investment Law in the Republic of Niger, OBR 63-105, 4 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., July 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Laws currently in force governing private investment in the Republic of Niger are Law No. 61-21 of July 12, 1961, which establishes an Investment Code, and Law No. 63-6 of

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of February 1, 1963, which modifies certain provisions of the first law relating to the repatriation of profits, salaries, and capital. The Code lists the types of enterprises having priority status and eligible to receive benefits provided for under the law. Law No. 63-6 modifies certain sections of the Investment Code, and makes the repatriation of profits, salaries of expatriate personnel, and of the invested capital, subject to the exchange regulations of the Franc Zone.

NORWAY:

"Administrative Structures in the Norwegian Fisheries," by Olav Lund, article, Norwegian Fishing and Maritime News, vol. 10, no. 1, 1963, pp. 7-8, 21, 25; "The Norwegian Fishery Legislation," by Olav Lund, vol. 10, no. 2, 1963, pp. 7-8, 33, 35, 37, 39, illus., printed. Norwegian Fishing and Maritime News, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

"Fiskefartoyers Lonnsomhet i 1961" (Fishing Vessel Profits in 1961), article, Fiskets Gang, vol. 49, no. 26, June 27, 1963, pp. 382-386, printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

"Fiskefartoyers Lonnsomhet i 1961, Sesongresultater" (Fishing Vessel Profits in 1961, Annual Results), article, Fiskets Gang, vol. 49, no. 27, July 4, 1963, pp. 396-399, printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

Statistisk Arbok for Norge, 1963 (Statistical Yearbook of Norway, 1963), Norges Offisielle Statistikk XII 107, 376 pp., printed in Norwegian and English. Statistisk Sentralbyra, Oslo, Norway. Includes, among others, statistical tables giving data on fishermen and gear, by counties; number of fishermen, by age group; fishing vessels by year of construction, type, and length; quantity and value of the fisheries; distant water fisheries; quantity and value of principal species; spawning cod and Finnmark spring cod by type of gear used; winter herring by disposition of landings and fishing gear used; production of some principal fishery products; results of sealing and whaling; and whaling companies and their operating equipment.

OCEANOGRAPHY:

Graduate Study in Oceanography, 11 pp., illus., printed. Graduate School, Oregon State University, Corvallis, Oreg. Includes sections describing the scope of oceanography, opportunities for oceanographers, undergraduate preparation, graduate preparation, degrees granted, financial support, facilities, housing, cultural and educational advantages, courses currently offered, and staff teaching and research interests.

International Marine Science, vol. 1, no. 2, August 1963, 28 pp., processed. Fisheries Biology Branch, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Contains editorial notes, a list of national committees for oceanographic research, national oceanographic programs, international projects, meetings on marine sciences, training facilities, miscellaneous news items, and activities of the United Nations and other agencies.

Oceanographical Observations in the Indian Ocean in 1961, CSIRO Aust. Oceanogr. Cruise Rep. No. 7, H. M. A. S. Diamantina, 90 pp., illus., processed, 1963. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

Oceanographic Ship Operating Schedules Planned for FY 1962, ICO Pamphlet No. 1, 25 pp., illus., processed. Interagency Committee on Oceanography, Federal Council for Science and Technology, Office of Naval Research, Rm. 1818, 17th St. and Constitution Ave. NW., Washington, D. C., March 1961.

The Relationship of Oceanography and Fisheries, by Wilbert McLeod Chapman, 23 pp., processed, 1963. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va. A paper prepared for delivery at the Annual Meeting of the American Fisheries Society, University of Minnesota, September 12, 1963. Fishery oceanography is defined as the study of the living resources of the sea using those aspects of oceanography (including biology, physics, chemistry, geology, and meteorology) that affect their abundance, availability, and exploitation. Objectives of fisheries oceanography include: (1) the assessment of the distribution of living resources of the sea; (2) the prediction of the abundance in time and space of presently used living resources of the sea; (3) the estimation of the maximum sustainable yield of presently used individual living resources of the sea; (4) the estimation of the exploitable production of individual stocks under natural and manmade conditions and of the living resources of the world ocean as a whole; (5) investigation of means of increasing the exploitable production of the living resources of the sea and means of protecting them from natural and manmade disaster; and (6) the prompt publication of these findings.

OREGON:

Habitat Improvement Project. 2--Federal Aid to Fish Restoration, by Donald M. Jacobson and Robert L. Borovicka, 6 pp., illus., printed. Oregon Fishery Division, Portland, Oreg., 1963.

Report for 1960/62, 33 pp., illus., printed. Oregon Fish Commission, Portland, Oreg.

PACIFIC OCEAN:

Fishing Industry Plenums on Research in the Pacific Ocean, OTS 63-21708, 11 pp., processed, 50 cents. (Translated from the Russian, Rybnoe Khoziaistvo, no. 1, 1963, p. 85 and pp. 87-90.) Office of Technical Services, U. S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., April 29, 1963.

PARASITES:

Preliminary Observations on Philonemiasis and Crepidostomiasis in Alaskan Fresh-Water Fish, by Kenneth A. Neiland, Informational Leaflet No. 16, 5 pp., illus., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, 1962.

PERCH:

"Systematic Position and Relationships of the Percesocine Fishes," by William A. Gosline, article, Pacific Science, vol. 16, no. 2, 1962, pp. 207-217,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

printed. Office of Publications, University of Hawaii, Honolulu 14, Hawaii.

PHILIPPINES:
"Preliminary Studies on the Comparative Chemical Composition of the Different Commercial Brands of 'Patis' in the Philippines," by S. V. Bersamin and R. S. J. Napugan (Bureau of Fisheries, Quezon City, Philippines), article, Chemical Abstracts, vol. 57, December 10, 1962, 15567i, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

PLATYFISH:
"Xiphophorus gordoni, a New Species of Platyfish from Coahuila, Mexico," by Robert Rush Miller and W. L. Minckley, article, Copeia, no. 3, September 25, 1963, pp. 538-546, illus., printed, single copy $2.50. American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

POISONOUS FISH:
"Potent Venom from a Little Fish," article, New Scientist, vol. 15, July 26, 1962, p. 182, printed. Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

POLLUTION:
"Die Entwicklung der Bodenseefischerei unter dem Einfluss der Abwasser" (The Development of the Bottom Sea Fishery Under the Influence of Pollution), by W. Numann, article, Osterreichs Fischerei, vol. 16, no. 6, June 1963, pp. 82-84, printed in German. Osterreichs Fischerei Verband, Scharfling am Mondsee, Austria.

Research for Clean Water, 39 pp., illus., printed, January 1, 1962. Robert A. Taft Sanitary Engineering Center, Bureau of State Services, Public Health Service, U. S. Department of Health, Education, and Welfare, Cincinnati, Ohio. A report on activities of the Research Branch, Division of Water Supply and Pollution Control, at the Robert A. Taft Sanitary Engineering Center.

Water Pollution Research 1962 (The Report of the Water Pollution Research Board with the Report of the Director of the Water Pollution Research Laboratory), 139 pp., illus., printed, 8 s. 6 d. (about US$1.20), 1963. Her Majesty's Stationery Office, York House, Kingsway, London WC2, England.

PORTUGAL:
"La Industria Portuguesa de Conservas de Pescado" (The Portuguese Canned Fish Industry), article, Industria Conservera, vol. XXIX, no. 287, May 1963, pp. 127-128, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

PRESERVATION:
Preservation of Fresh Fish, by W. Saenz and D. L. Durron, Special Service Bulletin No. 17, 49 pp., processed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., 1961.

PROTEIN:
"Evaluation of Protein in Foods. VIII--Influence of Quality and Quantity of Dietary Protein on Net Protein Utilization," by A. B. Morrison and others, article, Canadian Journal of Biochemistry and Physiology, vol. 41, February 1963, pp. 275-281, printed. Division of Administration and Awards, The National Research Council, Sussex St., Ottawa 2, Canada.

"Fish Protein Products Processable for Feed or Food," by Andrzej Boguslawski, article, Chemical Abstracts, vol. 58,,March 18, 1963, 6132a, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

RADIATION PRESERVATION:
Biochemical Aspects of the Radiation Method of Food Preservation, by L. V. Metlitskiy, OTS 63-20178, 38 pp., processed, 50 cents. (Translated from the Russian, Izvestiya Akademii Nauk SSSR, no. 6, 1962, pp. 869-884.) Office of Technical Services, U. S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., February 7, 1963.

ROUGH FISH:
Potential Use of Trash Fish Caught by Shrimp Boats, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D. C. 20416, 1963. Large quantities of trash fish are discarded annually by shrimp boats, mainly because of the problem of transporting the fish from the area of capture to a plant on shore. The production of hydrolyzed fish on board the trawlers was found to be impractical because of the liquidity and low protein content of the product. It does appear to be economically feasible, however, to land iced trash fish and can it for pet food.

SALMON:
Abundance, Size and Age of Red Salmon Smolts from the Kvichak River System, 1961, by Wilbur Church, Informational Leaflet No. 31, 10 pp., illus., processed. Division of Commercial Fisheries, Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, July 31, 1963.

Abundance, Size and Age of Red Salmon Smolts from the Wood River System, 1961, by Wilbur Church, Informational Leaflet No. 32, 13 pp., illus., processed. Division of Commercial Fisheries, Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, July 31, 1963.

The Age, Sex Ratio and Size of Fraser River Sockeye Salmon, 1915 to 1960, by S. R. Killick and W. A. Clemens, Bulletin XIV, 145 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminister, B. C., Canada, 1963.

"On the Carotenoids of Salmon Flesh (Lipochromes of Marine Animals. VI.)," by N. A. Sorensen, 1 p., Translation Series No. 164, processed. (Translated from the German, Zeitschrift fur Physiologische Chemie, vol. 235, 1935, p. 8.) Fisheries Research Board of Canada, Vancouver, B. C., Canada.

"Comparative Studies on Two Hemoglobins of Salmon. IV--N-Terminal Amino Acid," by Kanehisa Hashimoto and Fumio Matsuura, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, September 1962, pp. 914-919, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Forecast of Bristol Bay Red Salmon Run in 1962, Informational Leaflet No. 14, 23 pp., illus., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, 1962.

Forecast of Chignik Bay Red Salmon Run in 1962, by Thomas H. Richardson and David W. Narver, Informational Leaflet No. 13, 2 pp., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, 1962.

Standard Methods of Measuring Salmon, by Howard D. Tait, Informational Leaflet No. 8, 2 pp., illus., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, 1962.

SALT FISH:

"Effect of the Addition of Sugar in the Process of Salting Salmon," by E. A. Nasedkina, article, Chemical Abstracts, vol. 56, June 25, 1962, 15894f, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Prevention of Development of Rancidity of Salted Fish," by Yoshinobu Endo, article, Chemical Abstracts, vol. 56, June 11, 1962, 14683d, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Test of Certain Antioxidants for Preventing Rusting of Salted Fish," by N. V. Natenson, article, Chemical Abstracts, vol. 56, March 19, 1962, 6430b, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

SEALS:

"Molecular Association Behavior of Apomyoglobin I from the Seal (Phoca vitulina)," by Nevenka M. Rumen and Ettore Appella, article, Archives of Biochemistry and Biophysics, vol. 97, April 1962, pp. 128-133, printed. Academic Press Inc., 111 5th Ave., New York 3, N. Y.

"The Seal Catch, 1961," by E. Johannessen, article, Arsberetning Vedkommende Norges Fiskerier 1961, no. 10, 1962, pp. 1-19, printed. Fiskeridirektoratet, Bergen, Norway.

SEAWEED:

"Triabunna Site for Seaweed Industry," article, Fisheries Newsletter, vol. 22, January 1963, pp. 17, 19, printed. Commonwealth Fisheries Office, Department of Primary Industry, Canberra, Australia.

SHARK:

"Fish of the Bay of Bengal. II--Processing of a Shark Flesh," by A. N. Bose, S. K. Das Gupta, and B. N. Srimani (Jadavpur University, Calcutta, India), article, Chemical Abstracts, vol. 57, November 26, 1962, 14246i, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

SHRIMP:

"Contributions to the Knowledge of the Alpheid Shrimp of the Pacific Ocean. VIII--Losses of Specimens in the Fire of the Hawaii Marine Laboratory," by Albert H. Banner and Dora M. Banner, article, Pacific Science, vol. 16, no. 2, 1962, pp. 238-240, printed. Office of Publications, University of Hawaii, Honolulu 14, Hawaii.

An Improved Prawn Trap, by T. H. Butler, Circular No. 67, 7 pp., printed. Fisheries Research Board of Canada, Biological Station, Naniamo, B. C., Canada, February 25, 1963.

"Some New Indices of Quality for Ice Stored Prawns," by T. K. Govindan, article, Science and Culture, vol. 28, no. 1, 1962, pp. 36-37, printed. Central Institute of Fisheries Technology, Ernakulam, South India.

SMALL BUSINESS MANAGEMENT:

Cooperative Arrangements Among Small Food Processors, by Wallace Rehberg, Hugh L. Cook, and Stanley Hack, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D. C. 20416. Cooperative arrangements could increase the survival rate of small firms in the food processing industries. Most such arrangements among food processors in Wisconsin have been used primarily for purchasing supplies, developing brand names, and exchanging management information. These arrangements have helped small, independent food processors gain the economies of large-scale operations, but economic opportunities suggest that the functions could profitably be expanded.

The Flow of Funds in Manufacturing Firms, by Caleb A. Smith, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D. C. 20416. Presents: (1) flow-of-funds data for 151 firms over a 7-year period; (2) a discussion of the tables; and (3) illustrations of possible uses of the data, especially in counseling small businessmen. Only one-fourth of the firms studied had, during their year of greatest expansion, obtained half or more of the funds for plant and equipment from sales of stock and assumption of long-term liabilities. Less than 1 in 10 covered the whole expenditure from these sources.

Investment Decision Making in Small Businesses, by Martin B. Solomon, Jr., Management Research Summary, 4 pp., illus., processed. Small Business Administration, Washington, D. C. 20416, March 1962. Small businessmen can profitably give attention to three phases of investment decision making--planning, search, and choice. The report deals mainly with the search for and choice of investment opportunities. The purpose of the study was to determine what procedures will help the small businessman make sound decisions about the investment of his company's funds. Conclusions are based primarily on a study of the investment decisions of 40 small business firms.

Marketing Through Food Brokers, by Frank Johnson, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D. C. 20416. Brokers, operating in one specific locale, can often develop more effective selling relations than company sales representatives. When selecting new companies to represent, brokers seek those whose products can be worked into the existing sales structure and not conflict with products already being handled. The greater part of a broker's business comes from his top four lines. Total commissions tend to be proportional to the number of companies represented.

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Operations Research in Small Business, by N. Paul Loomba, Albert Buckberg, and Bob R. Holdren, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D.C. 20416. Emphasis on a "systems" approach is perhaps the most important contribution of operations research to small business. The systems approach gives an executive information he can use in making decisions that involve conflicting objectives. Small firms can use the operations research approach and methods without incurring prohibitive costs. However, some of the applications of operations research, such as setting inventory policy, are complicated and may be too expensive for small companies.

Pointers on Raw Materials Inventory Control, by David Schneider, Management Aid No. 155, 4 pp., processed. Small Business Administration, Washington, D.C. 20416. Raw materials represent a major part of the investment in many small plants. Proper inventory control can help owner-managers to increase the return on that investment. Proper inventory control involves the procurement, care, and disposition of materials. It helps to keep stocks moving through the plant and thus prevents investing money in unnecessary stocks. This leaflet discusses steps that can be used in setting up inventory control or in checking an existing control system. Suggests several kinds of records that may be used to control inventory efficiently in small plants.

Puerto Rican Manufacturing--Local and Nonlocal Ownership, by Amadeo I. D. Francis, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D.C. 20416, 1963. In number and in production totals, nonlocally owned manufacturing firms in Puerto Rico grew much faster between 1954 and 1958 than did locally owned firms. Nevertheless, shipments within the Commonwealth by locally controlled firms expanded by $78 million during the 4-year period. The growth in sales within Puerto Rico by nonlocally owned firms was accomplished primarily by competing with imports--that is, replacement of imports by production in the Commonwealth itself.

Redistribution of Trade in Population Shifts, by Surinder K. Mehta, Management Research Summary, 4 pp., processed. Small Business Administration, Washington, D.C. 20416. Suburbanization of retail establishments and sales has accompanied suburbanization of population in Rhode Island, according to the report. In general, the advantages of older retail trade centers in volume of sales per establishment and per capita sales have lessened. It was found, however, that per capita sales in Providence were still relatively very high. Redistribution of population seems to have had little or no effect on the distribution of wholesale sales, or on volume of sales per establishment in the various communities. There was some effect, however, on the distribution of wholesale establishments. The suburbanization of population seems to have had some effect on the distribution of the service trades but the effect varied considerably by type of service trade activity.

A Study of Retailer Survival, by Elizabeth Y. Deran, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D.C. 20416. A summary of a study on how successful small retail firms differ from less successful and failing firms. The most successful firms were more likely to pursue a vigorous merchandising policy, consult outside accountants, post records daily, and use operating ratios than the less successful firms. A larger percent of the successful owners had prior managerial experience in the same or related lines. The less successful firms had more problems due to neighborhood changes, personal affairs, chainstore competition, or excessive customer credit.

SPOILAGE:
"Bacteriology of Spoilage of Fish Muscle. I--Sterile Press Juice as a Suitable Experimental Medium" by Peter Lerke, Ralph Adams, and Lionel Farber, article, Applied Microbiology, vol. 11, no. 5, September 1963, pp. 458-462, illus., printed, single copy $3. The Williams and Wilkins Co., 428 E. Preston St., Baltimore 2, Md.

SQUID:
"Polysaccharides from the Liver of the Squid Ommastrephens Sloani pacifus," by Eugene Rosenberg and Stephen Zamenhof, article, Journal of Biochemistry, vol. 51, no. 4, 1962, pp. 274-276, printed. Editorial Board Dept. of Biochemistry, Faculty of Medicine, Tokyo University, Bunkyoku, Tokyo, Japan.

STERN TRAWLERS:
"German Designers Discuss Stern Trawlers," article, World Fishing, vol. 10, no. 12, 1961, p. 60, printed. John Trundell and Partners Ltd., St. Richards House, Eversholt St., London NW1, England.

TRAWLING:
"Ob Optimal'nykh Skorostiakh Tralieniia" (On Optimum Trawling Speeds), by V. N. Chestnoi, article, Rybnoe Khoziastvo, vol. 37, no. 7, 1961, pp. 43-49, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

TROUT:
Studies of Two Races of Cutthroat Trout in Northern Idaho, by Robert C. Averett, 58 pp., illus., printed. Idaho Fisheries Division, Moscow, Idaho, 1962.

UNDERWATER TELEVISION:
"Underwater Television Observations of Haddock (Melanogramma aeglefinus--Linneas) in the Codend," by R. Livingstone, Jr., article, Journal du Conseil, vol. 27, 1962, pp. 43-48, illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund-Slot, Denmark.

UNITED KINGDOM:
"Las Conservas de Pescado en el Mercado Ingles" (Canned Fish in the English Market), by Alevin, article, Industria Conservera, vol. XXIX, no. 287, May 1963, p. 119, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

U. S. S. R.:
Complete Mechanization and Automation in the Fish Industry--An Urgent Task, by A. A. Ishkov, OTS 63-21606, 20 pp., illus., processed, 50 cents. (Translated from the Russian, Rybnoe Khoziaistvo, no. 2, 1963, pp. 3-9.) Office of Technical Services, U. S.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Department of Commerce, Ohio Dr. and Independence Ave. SW., Washington 25, D. C.

Problems of Fishing Industry Development, by A. Ishkov, OTS 63-21330, 8 pp., printed. (Translated from the Russian, Pravda, January 28, 1963, p. 2.) Office of Technical Services, U. S. Department of Commerce, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., March 15, 1963.

Translations from Rybnoye Khozyaystvo (Fishing Industry), No. 2, 1962, USSR, 29 pp., printed, 75 cents. Office of Technical Services, U. S. Department of Commerce, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., June 10, 1963.

VITAMINS:

"Biological Activity of Vitamin A in Fish Liver Oil," by H. Baba, article, Chemical Abstracts, vol. 57, October 29, 1962, 11626a, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Vitamin $B_1$ Content in Freeze-Dried Fish, by E. S. Tkachenko, article, Chemical Abstracts, vol. 57, July 23, 1962, 2630g, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

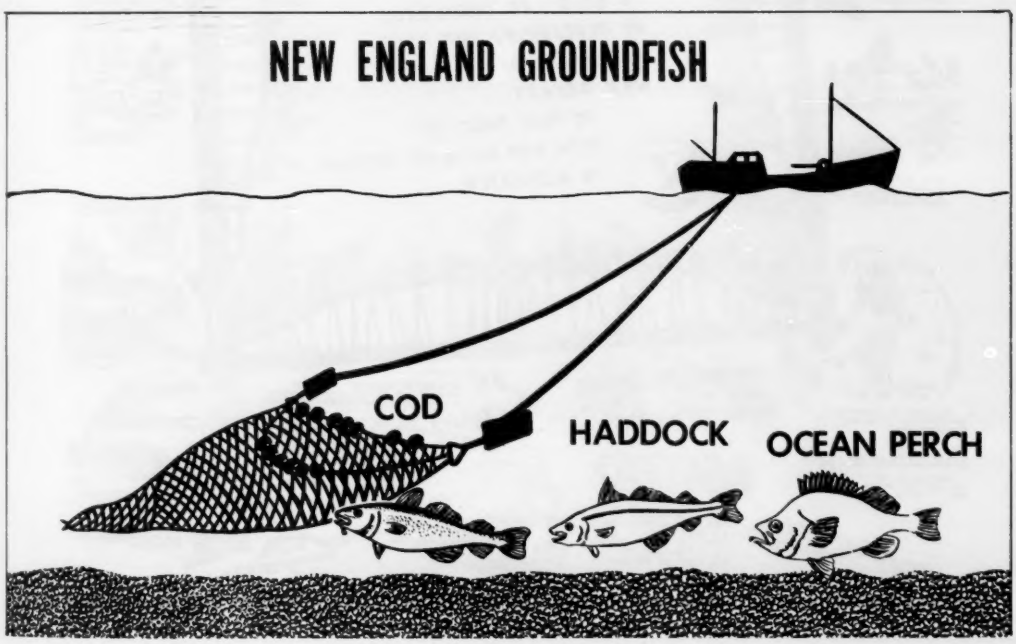
WHALES:

"Analysis of Samples of Ambergris," by A. D. Baynes-Cope, article, Nature, vol. 193, 1962, pp. 978-979, illus., printed. St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

YUGOSLAVIA:

The Balkan Lake Ohrid and Its Living World, by Sinisa Stankovic, Monographiae Biologicae, vol. IX, 357 pp., illus., printed, 1960. Uitgeverij Dr. W. Junk, The Hague, Netherlands.

"Aus den Fischereiinstituten Bericht uber einen Studienaufenthalt im Institut za Oceanografiju i Ribarstvo, Split (Jugoslawien)" (On Fishery Institutes; Report on a Study Trip to the Institute of Oceanography and Fisheries, Split, Yugoslavia), by H. Jahnichen, No. 215, 4 pp., illus., printed in German. (Reprinted from Deutsche Fischerei-Zeitung, vol. 10, no. 3, 1963, pp. 92-95.) Uberreicht vom Institut fur Fischereiwesen, der Humboldt-Universitat zu Berlin, Josef-Nawrocki-Strasse 7, Berlin-Friedrichshagen, Germany.



Research and Management for FOOD and RECREATION
THE WORK OF THE FISH and WILDLIFE SERVICE U.S. DEPARTMENT OF THE INTERIOR
Educational Aid No 1
THE BUREAU OF COMMERCIAL FISHERIES
THE SERVICE IS COMPOSED OF TWO BUREAUS
THE BUREAU OF SPORT FISHERIES AND WILDLIFE
THE BUREAU IS PLEDGED TO STRENGTHEN AND MAINTAIN A VIGOROUS FISHING INDUSTRY.
OF THE 2.6 MILLION TONS OF FISH CAUGHT ANNUALLY — INDUSTRY TAKES .12 MILLION TONS, FOOD, 1.30 MILLION TONS, AND AGRICULTURE, 1.18 MILLION TONS.
RECREATION PROVIDED BY THIS BUREAU IS NOT "SPORT FOR SPORT'S SAKE" BUT A WAY OF NECESSARY RELAXATION AND RESPITE FOR A PEOPLE WHOSE WORK HAS SHIFTED SO LARGELY FROM PHYSICAL TO MENTAL EFFORT.
50 MILLION AMERICANS HUNT OR FISH EACH YEAR. OTHER MILLIONS ENJOY WATCHING OR PHOTOGRAPHING OUR WILDLIFE
THE LAND IS LIMITED — THE SEA MUST PRODUCE MORE. RESEARCH HAS FOUND NEW METHODS OF FISHING — AS WELL AS NEW AREAS TO FISH.
A MAJOR PROBLEM FACING THE NATION IS THE CONSOLIDATION OF ITS FISH AND WILDLIFE RESOURCES WITH THE CHANGING COMBINATIONS OF LAND AND WATER, AND TO MEET THE CHALLENGE OF DEVELOPING THE FOOD POTENTIAL OF THE LAKES AND OCEANS.
TO THAT TASK, THE FISH AND WILDLIFE SERVICE IS DEDICATED.
AS IN FARMING — EACH ACRE OF WILDLIFE LAND OR WATER MUST PRODUCE MORE BENEFITS FOR MORE SPECIES.
GOVERNMENT LABORATORIES ARE FINDING BETTER WAYS OF USING PROTEINS FROM FISH AND FISH PRODUCTS
THE 28 MILLION ACRES OF WILDLIFE REFUGES ARE NOT ONLY HAVENS FOR FISH AND WILDLIFE — BUT ALSO HUGE OUTDOOR WILDLIFE LABORATORIES.
RATIONAL MANAGEMENT OF THE ALASKAN FUR SEALS HAS INCREASED THEM FROM 130,000 ANIMALS TO 1½ MILLION, YIELDING THOUSANDS OF SEAL SKINS EACH YEAR.
PESTICIDE RESEARCH WILL GIVE THE FARMER THE PROTECTION HE NEEDS — WITHOUT ENDANGERING FISH AND WILDLIFE.
CONSERVATION HAS GONE TO SEA.
THE WORLD HAS AWAKENED TO THE IMPORTANCE OF THIS GREAT UNDEVELOPED AREA.
AS MAN LEARNS MORE ABOUT THE OCEAN, THE CLOSER HE COMES TO HIS GOAL OF "FARMING THE SEA" — RAISING HIS FOOD INSTEAD OF HUNTING FOR IT.
AMERICA BELONGS TO NINE INTERNATIONAL COMMISSIONS DEALING WITH THE PRODUCE OF THE SEA.
WITH PROPER PLANNING — FISH AND WILDLIFE ARE ASSURED SUITABLE HOMES IN WATERSHED DEVELOPMENT PROGRAMS
WHEN NEW DAMS ON BIG RIVERS THREATEN OR DESTROY SPAWNING AREAS OR FISH MIGRATIONS, THE SERVICE POLICY IS TO IMPROVE THE REMAINING HABITAT AND TO STOCK THE STREAMS.
THE MANAGEMENT OF FISH AND WILDLIFE AND THE DEVELOPMENT OF LAND AND WATER PROJECTS ARE A "PACKAGE DEAL," AND MUST BE SO CONSIDERED.
FISH LADDER
THE POPULAR FARM PONDS HAVE INCREASED THEIR PRODUCTION — DUE TO INTENSIFIED RESEARCH.

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